

15.491 Class Notes

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1 Summary of Key Concepts and Ideas

This section includes general knowledge that are applicable beyond specific topics. It is broken down into “key words” and “concepts.” This is by no mean a complete list but more of a list of things that I did not know before.

1.1 Overall Philosophy of This Course

This class focuses on “why” hedging (e.g., why the tactics may be useful, why good tools are worth it) and less on “how” to hedge (e.g., less on the tactics, no menagerie of derivatives etc).

1.2 Key Words

- W.1 Market exposure (or exposure):** measures the proportion of money invested in the same industry sector. For example, a stock portfolio with a total worth of \$500,000, with \$100,000 in semiconductor industry stocks, would have a 20% exposure in chip stocks.
- W.2 Risk appetite:** the level of risk an organization is prepared to accept, before action is deemed necessary to reduce it. It represents a balance between the potential benefits of innovation and the threats that change inevitably brings. Common levels include:
- Averse: Avoidance of risk and uncertainty is a key organisation objective.
 - Minimal: Preference for ultra-safe options that are low risk and only have a potential for limited reward.
 - Cautious: Preference for safe options that have a low degree of risk and may only have limited potential for reward.
 - Open: Willing to consider all potential options and choose the one most likely to result in successful delivery, while also providing an acceptable level of reward and value for money.
 - Hungry: Eager to be innovative and to choose options offering potentially higher business rewards, despite greater inherent risk.
- W.3 Speculate:** practice of engaging in risk financial transactions in an attempt to profit from short or medium term fluctuations in the market value of a tradable good such as a financial instrument, rather than attempting to profit from the underlying financial attributes embodied in the instrument such as capital gains, interest, or dividends.
- W.4 Value at risk (VaR):** a widely used risk measure of the risk of loss on a specific portfolio of financial assets. For a given portfolio, probability and time horizon, VaR is defined as a threshold value such that the probability that the mark-to-market loss on the portfolio over the given time horizon exceeds this value (assuming normal markets and no trading in the portfolio) is the given probability level. For instance, if a portfolio has a one-day 5% VaR of \$1 million, there is a 0.05 probability that it will fall in value by more than \$1 million over a one day period if there is no trading, which is called “VaR break” when a loss exceeds the VaR threshold. Refer to slides on Feb. 15th (Lecture 2 on Aspen) for how to calculate the 5% and 95% tail.
- W.5 Discounted Cash Flow (DCF)** is typically used to value an asset using concepts of the time value of money to discount all future cash flows to its present values (PVs).
- W.6** “Ride the curve”
- W.7** “Fatter tails” describe the kurtosis of a distribution.
- W.8** “Debt capacity”: how
- W.9** Costless caller: give up future up-side to protect potential down-side. For some reason most firms seem to be more willing to give up future up-side instead of putting down cash right now into insurance. A derivative like this does not go on a balance sheet because the balance sheet reflects expected value without showing any risk. This could contribute to why derivatives are popular since the managers do not need to get signatures.

1.3 Key Ideas

I.1 Whenever we ask whether a firm should hedge, we really need to examine two questions:

- What is the company trying to accomplish before hedging? E.g., Apache (Sec.5.2) has two core operations: lower cost structure, making acquisitions at the right time.
- How is the finance getting in the way? E.g., in the Apache case, hedging help in the acquisitions when the price is low and the firm goes into cash crunch time.

This also needs to the next concept which is what is the objective of the hedging.

I.2 The key is to define the objective function, and then the instrument needed can be determined. For instance,

- Minimizing the general variance is typically the wrong objective; we want to identify the right variance for each firm to optimize.
- The MM theorem of hedging says hedging has no direct value in the sense that hedging does not change the expected value; hedging has indirect value, or change in the risk. See Table 3.1 in the textbook.

I.3 When not to hedge? Two major problems with hedging are basic risk and liquidity risk. See the case of MGRM for an example (Section 5.3).

I.4 The real financing problem: friction between the company and outside capital sources is the issue:

- There are incentive problems and information problems;
- These problems distort the company's operations and its investment program, hurting shareholder value;
- Your task is to organize the company's contract with external capital markets to minimize these frictions, and hedging is one way to do so.

Example: the Omega Drug case in *A Framework For Risk Management* by Frott, Scharfstein and Stein¹ illustrates hedging has no direct value but rather indirect value.

I.5 Derivative vs. insurance: derivative is typically on index (averaged market behavior) which is general event, whereas insurance is tailored to idiosyncratic event like a custom-tailored suit.

I.6 A limited view of risk management: LHS is assets, RHS is liabilities.

- LHS: there is risk too because we need to take risks to earn an return, but the point is that these are risk we choose to take on because we have expertise in handling it. Some hedging is appropriate on the LHS but it is not the focus or the objective.
- RHS: not a profit center, the taks is to facilitate the activities on the LHS; typically we do focus on hedging to avoid any problem that might disrupt the cash flow, for instance.

Both sides of the balance sheets include risk, it's just that the left is what the company is good at, and the right is not.

I.7 **The MM theorem of hedging** says that hedging does not directly increase the value of a firm because risk and return go hand-in-hand. Prof. Parsons disagrees because there are indirect effects. Investors are risk-averse, and the company should price risks the way that investors do, but company does not care which fairly priced risks pass through its balance sheet to investors. It only cares about those for which it can capture an above market return – and thus belong on the LHS of its balance sheet.

¹HBR Nov-Dec 1994

I.8 Two step in modeling exposures:

- (a) Step one: identify risk factors, which are underlying variables like the exchange rates and market movements. For instance, we tend to use the log-normal model of stock prices which states returns are normally distributed, and prices are log-normally distributed (b/c of bounds). There are two classic risk models:
- Random walk (geometric Brownian motion): commonly used for prices. Through time prices follow a random walk.
 - Mean reverting process: commonly used for interest rates.
- (b) Step two: how cash flow is sensitive to risk factors. There are two basic ideas are sensitivity analysis and
- i. Bottom up model: sensitivity analysis & scenario analysis.
 - The basic one is the simple sensitivity analysis. Limitations: the likely range of variation may be entirely wrong; hard when there are multiple variables moving together; need to account for the correlation between multiple variables;
 - A more advanced bottom up model: scenario analysis. We look at variations in an array of risk factors moving together. E.g., Shell performs these analysis every three years. E.g., bank stress test set forward by the US treasury: what could happen to the banks' balance sheets in these bad scenario.
 - ii. Top down model: observing exposure.
 - The most common models are linear, say, the CAPM (one-factor model in the sense that β is the slope) $R_{it} = \alpha_i + \beta_{im}R_{mt} + \epsilon_{it}$ and we derive β from data (i.e., how much does my company's stock change when the market changes). This model assumes a positive relationship.
 - The next question is to identify how many factors are necessary.
 - Limitation: does not know how things change as variables change.
- (c) Note: most models only account for linear exposures (e.g., CAPM assumes higher return and higher risk go hand-in-hand) because there are so many uncertainties that go into the assumptions that you are not necessarily more precise. Though there are times that introducing non-linear exposure could be useful. Examples:
- Contract interest rate that are different from market price may produce price caps or floors which is a non-linear exposure.
 - The exposure of a call option to changes in the stock price (its exposure changes depend on whether it's in for the money or out of the money).
 - Nuclear plant capacity factor: highest during the first couple of years, decrease first then increase again.
 - Petroleum industry has various stages in life-cycle, and the royalty trusts has a low beta (0.194) and exploration & production has a (0.873)

The Black-Scholes model shows us how to price security with a non-linear exposure.

- I.9** What to hedge? It is most important to look at the big picture, e.g., the net/full exposure, including factors like competitiveness change (e.g., how does interest rate changes affect your competitors vs. you).
- I.10** Balance sheet is a snapshot of the current state, which does not capture the risk exposure (more like a derivative). One way to think about it is to buy a bunch of swaps which would not alter the balance sheet but would change the risk exposure.
- I.11** Exposure measurement of fixed vs. float interest rate: bonds tend to be fixed interest rate, and bank debts tend to be float interest rate. The exposure measurement can be done in two ways:

- (a) By market value: floating interest rate means zero exposure, whereas fixed interest rate means exposure;
- (b) By cash flow: fixed interest rate means no exposure, and fixed interest rate means exposure.

Then the question of exposure measurement is whether a firm is more concerned with the value or the cash flow. A couple of factors may come into play:

- If a firm is expanding, the timing is very important and a short in cash may cause secondary damage and affect the speed of expansion;
- Short term vs. long term investment need and plan;

2 Air Canada

2.1 Lecture Discussion

1. **Why hedging?** For instance, why would airline want to hedge foreign exchange rate?
 - “insulate from cost increase” is the wrong reason;
 - Yes risk and return go hand-in-hand thus mitigating some of the risk does reduce the return;
 - But these risks might generate secondary consequences (or indirect effect) for this firm, e.g., foreign exchange rate moving in an adverse direction may disrupt the cash flow of a firm and prevent it from placing an important asset purchase;
 - To some degree, hedging is more like **“cash cushion,”** meaning that we pay to protect ourselves against any sudden shortage of cash;
 - On a higher level, risk management is about **breaking** business into pieces, and **focusing** on the pieces we have an “comparative advantage” (i.e., when we can **produce α**). Instead of wasting capital on the non-alpha business, we would outsource them to people that have the expertise.
2. Hedging practice varies and is only a piece of the risk management.
3. The boundary between hedging and speculating might be blurry.
4. In looking at the sensitivity matrix, keep in mind that it does not typically include correlated relationship between different variables.

2.2 Summary of Case Document “Air Canada – Risk Management, Ivery #910N37”

- Airline industry faces challenges:
 - 911;
 - breakout of disease (SARS in 2003, H1N1 in 2009);
 - financial crisis (2008, 2009) both lowered the cost also lower the traffic.
 - Largest cost increase is fuel cost: \$27 (2008) to \$133 (2008).
- Solutions:
 - Consolidation: 10% of airlines account for 80% of the \$130 billion industry;
 - Code-sharing alliances: drive up load factors which is important b/c high fixed cost;
 - Global expansion: more profitable, 45% of all US revenue;
 - Low-cost carriers: superior operations, lower cost airports, flying point-to-point, a single type of aircraft;
- History: acquired largest rival in 2001, unsuccessful merging, filed bankruptcy protection in 2003, two failed proposals then a successful one in 2003, doing fine 2004-2007 but lost money due to economy in 2008-2009.
- Past focus: cost cutting, reducing capacity, managing risk from pending labor contracts and pension solvency deficit;
- **The CEO Rovinescu’s four initiatives:**
 1. Expanding international operations;
 2. Generating incremental revenue and significant costs savings;

3. Focusing on customer service and promoting the premium cabin; F
4. Fostering culture of change.

Risk interact with the international operations & premium cabins mostly, Q3 2010 revenue was up due to \$256 million or 17% increase in the international routes led by the Pacific region, and premium cabins counts for half of the increase in sales.

- **Quadrant IV Operational risk (reliability and repeatability):** high volume of operations in large airlines lead to high frequency operational risk, thus requiring preventative maintenance and safety, backup systems and contingency;
- **Quadrant II high severity and low frequency risk is transferred through aviation insurance:** I think this is because
- **Quadrant I risks that are beyond control:** interest rates, pension reserves, foreign exchange, severe weather, fuel costs, stock prices.
- **Current risk management policies (for Quadrant I) uses derivative financial instruments** for risk management, not for generating profit. Current practice includes:
 - Hedging jet fuel. **Fuel price increase is much risk:** 20-30% of all expense, \$1 increase costs the US airline industry \$425 million in additional operating costs. Thus it is well hedged in well financed company for as much as 86% of jet fuel needs for upcoming yr. At the end of Q3 2010, AC hedged 34% of remaining 2010 jet fuel, and 8% for 2011. Though American Airlines stopped hedging jet fuel prices.
 - Liquidity and interest rate risks: use swaps and interest from cash reserves to mimic the return from a fixed interest rate for the 40% debt at a floating rate, the rest 60% debt at a fixed interest rate.
 - Foreign exchange: convert 29% non-Canadian revenue to US dollars, the rest was not naturally hedged but could be;
 - Cover its exposure from Performance Share Units (PSUs): purchase forward contracts. Each PSU entitled employees to receive a payment in the form of an AC common share or cash on the basis of the market value of the share.

2.3 Summary of Air Canada's 2011 Annual Report

- Strategy (p. 9): profitable growth, sustainability to create value, lower risk profile.
 1. Leveraging the international network:
 - Status: 10% increase in 2010, 6.6% increase in 2011;
 - Commercial alliances: Star Alliance, transatlantic revenue sharing joint venture called A++ with United Airlines and Deutsche Lufthansa AG.
 - Well-positioned hubs at Toronto (110% increase in international connecting traffic from 2009 to 2011), Montreal and Vancouver;
 - Capture sixth freedom traffic from the US, attract traffic between the US and other destinations
 - Focus on markets with high growth economics e.g. Asian and South America.
 2. (Cost structure) Leveraging new opportunities for revenue growth and cost transformation:
 - Sustainable reduction in cost without compromising customer experience;
 - CTP (cost transformation program) in mid-2009: renegotiation of contracts, operating process improvements, productivity gains.
 - Business Transformation team: use of technology and streamlining of processes;

- Low-cost market segment: maintaining mainline operators, start lower fares, prevent erosion of passengers on leisure routes through a low-cost carrier venture;
 - Introducing Boeing 787 into fleet in 2014 would reduce operating expenses through fuel and maintenance savings and higher workforce efficiency.
3. (High margin market) Engaging with customers with a focus on premium passengers and premium products: premium cabin growth 8.3% in 2011; broaden access to corporate customers by focusing on small to medium size enterprises;
 4. Enhancing the corporate culture and developing a strong employee brand: difficult labor negotiations in 2011; more entrepreneurial culture, all employees are encouraged to act as owners and ambassadors of the airlines.
- Financial and capital management (p. 36), mostly focus on liquidity.
 - End of 2011 has cash, cash equivalents and short term investment of \$2099 million, 18% of operating revenue (aircraft fuel + ownership + other operating expenses) from Table in Section 10:

$$\frac{2099}{2753 + 2918 + 3242 + 2699} = 18.076\% \quad (1)$$

End of 2010 has liquidity:

$$\frac{2192}{2519 + 2625 + 3026 + 2616} = 20.32\% \quad (2)$$

- Air Canada has a minimum unrestricted cash balance in excess of a target liquidity level of 15% of annual operating revenues to meet capital commitments, contractual and pension funding obligations.
 - Gains in cash flow: cash from operating activities, sale of assets, borrowings, shares issued, investments.
 - Loss in cash flow: fuel hedge settlements, premiums and collateral deposits, employee benefit, investments, paying off long-term debt and finance lease obligations. Capital expenditure means a business spends money to buy fixed assets or to add value to an existing fixed asset.
 - 2011 Q4 free cash flow is negative due to decline in operations, higher pension payments, increase in capital expenditures.
- Financial instruments and risk management (p. 48):
 - Derivative hedging to mitigate risks, designed to be offset by changes in cash flows to migrate the risk not to generate trading profit.
 - Interest risk in fixed and floating rate debt and asset lease (15 Dash 8-400 aircraft to Jazz): a portfolio basis (e.g., forward start interest rate swaps with an aggregate notional value). Long term: 60% fixed, 40% floating. Short term: 75% fixed to adjust to prevailing market conditions.
 - Foreign exchange risk: 20% converted to US dollars, rest using foreign exchange derivatives like spot transactions and US dollar investments which had maturity dates corresponding to the forecasted shortfall dates. Foreign currency options and swap agreements to purchase US dollars against Canadian dollars.
 - Fuel price risk: derivative contracts with financial intermediaries on jet fuel (only short term), crude oil-based commodities, heating oil, crude oil(longer term).
At the end of 2011, hedged 23% of 2012 jet fuel at an WTI equivalent weighted average capped price of \$114/barrel, plus crude-oil based contracts (call options and call spreads) for 2012.
Discounted hedge accounting in Q3 2009.

- Sensitivity of results (p. 61): estimated impacts are not additive, do not reflect the interdependent relationship of the elements. Focus on fuel cost: 2011 spent 3375 on fuel cost (Sec. 10), \$3375 million on \$94/barrel, that's about 35 million barrels, somehow this amounts to \$24 million increase in operating cost.
- Risk factors (p. 62): operating risk, leverage (leases, economic condition), need for additional capital and liquidity, economic and geopolitical conditions, pension plans, fuel cost, labor cost, foreign exchange, competition.

3 Aspen Technology: Currency Hedging

- Simulation programs for the chemical, petroleum, and petrochemical industries.
- Exhibit 5a: exposure to changes in exchange rate b/w US dollars and UK pounds: sales in UK pounds is more than 10% of total sales:

$$\frac{5865}{57498} = 10.2\% \quad (3)$$

- Exhibit 5b: next year's cash flow, sales (10.2%) and expenses (9.4%) would be affected.

$$\frac{2722 + 1548}{26685 + 15181} = 10.2\% \quad (4)$$

$$\frac{4940}{52351} = 9.4\% \quad (5)$$

- To eliminate all transaction exposure from foreign-currency denominated license contracts, Aspen:
 - Sale of non-US dollar installments receivables for dollars to two financial intermediaries.
 - Entering into forward currency agreements when the installment-payment license contracts were signed. It's hard to hedge long-term forward contracts, so Aspen entered a series of one-year forward contracts swapping each existing contract for a new contract as it expired.

So that's about 3715 UK pound (or \$5865) hedging.

- Net exposure (take into account hedging): prior sales are hedged, we are left with current sales in Exhibit 5b alone, which is less. But current sales are used to finance expenses (which is more), so net exposure is actually favoring a low pound-to-dollar exchange rate?
- What to hedge? Cash flow, because hedging does not drain the firm out of cash temporarily, and the liquidity of the firm matters.
- The exposure is created b/c Aspen allows customers to pay in local currency and by installments.
- How else might the exchange rate affect Aspen's long-run competitive position? shortage in cash could affect R&D.

4 Walmart: Interest Rate Swapping

- An interest rate swap (IRS) is a financial derivative instrument where two parties exchange interest rate cash flows. Variation includes:
 - The most common form is, the “payer” pays a fixed rate (the **swap rate**) to the “receiver,” and the receiver pays the floating rate to the payer. Notice there is no exchange of the principal amounts and the interest rates are on a notional (i.e., imaginary) principal amount.
 - Floating-to-floating rate swap: indexed to different reference rate (e.g., LIBOR, EURIBOR);
 - In different currencies;
- Fair value is a rational and unbiased estimate of the potential market price of an asset. It is the amount at which the asset could be bought or sold in a current transaction. Fair value is close to the market price (the efficient market hypothesis) or diverges from market price (behavioral finance).

Additional reading: Peter Maloney’s *Managing currency exposure: the case of western mining* is also a good reading that covers how Western Mining decided to stop hedging US Dollars.

See Section 1.3 for some key concepts discussed during lecture, including: market exposure of fixed vs. floating interests.

5 Hedging Oil and Gas Prices

This section covers a guest lecture by EME and two case studies: Apache and MGRM. Both cases have to do with hedging oil and gas prices.

5.1 Guest Speaker from EME

Aram Sogomonian, vice president of Risk Management for Edison Mission Energy (EME). Background on EME:

- Filed bankruptcy on Dec. 17, 2012. Edison International (EIX) has reached an agreement with EME and would transfer its ownership to EME's creditors.
- Wind plants, natural gas, and coal plants.
- One 180MW natural gas plant in Turkey.

5.2 Discussion: Apache Case

Apache has two core values:

- Lower cost structure from being a secondary/independent oil company. A quote from Apache's CEO is that they are the pig behind the harvesters.
- Making acquisitions when they become available, getting the good deals done quickly. The strategy of being there when opportunity strikes is a source of value for Apache.

where hedging the downside helps the second core value shown above.

This leads to the two key questions to ask in determine whether a firm should hedge or not. See **I.1**

5.3 Discussion: Metallgesellschaft (MGRM) Case

Reading: *Maturity Structure of a Hedge Matters: Lessons from the Metallgesellschaft Debacle* by Mello and Parsons in Journal of Applied Corporate Finance.

- MGRM's key strategy is to hedge long-term exposures with short-term instruments. It basically provide marketing price insurance:
 - Long-term contracts, 5-10 years of deliveries;
 - Rolling stack: buy long position in short-dated futures, 1-2 months initially;
 - Endogenous credit risk: max scale, embedded option.
- There are two technical problems and one strategic problem:
 1. Liquidity risk of using futures. Without using futures, if gas price rises too high, MGRM loses money; if the gas price drops too low, the customers may go out of business and cannot execute the contract. With futures, the two sides pay as they go by putting down "initial margin" and "variable margin" that the credit risk is maximum one day. This means that MGRM needs to put up money instantly in the futures, but MGRM's delivery contract is long-term and it is not been paid by the difference in market price everyday, so MGRM is exposed to liquidity risk. See Table 1 as an example. Again, futures are designed to minimize credit risk (by settling down daily) in trade-off to liquidity risk (money is tied down).
 2. Basis risk on a maturity mismatched hedge: the long-dated futures and the short-dated futures are different commodities. The two prices may or may not be correlated, which creates basis risk. Compare Table.1 and Table.4, MGRM lost 1.17 billion in futures contract, and gains 479 million in delivery contracts, so in total MGRM lost due to basis risk.

3. The strategic problem is the speculating with futures. They are really speculating based on that the crude oil spot price is more or less flat, vs. the crude oil futures are going up.

6 Grosvenor Group Ltd: Cash Management

Today we start the second half of the course which focus on the risk assessment and management beyond just hedging. Prof. Parsons thinks people over-used the hedging paradigm/model and that there are many other aspects in risk assessment, project finance (why we structure infrastructure financing a certain way, e.g., bio firms issuing equity), etc.

6.1 Lecture: Cash Management as Risk Management

Reference: Ch 14 (Equity Policy) in the textbook. We are interested in how firms make decision on “cash to assets:”

- Apple Corp’s 2012 decision to pay dividends. Its cash (liquid assets) value is 3/4 of its total value as of June 2011.
- US Cash to assets from 1950 to 2010 (insert plot) has been between 5% (1970-1980) and 22% (2003 to now).
- Debate at Samsung: it pays a small dividend relative to the amount of cash at hand. The CEO’s argument is that it is in a competitive market and that there is large uncertainty of whether there will be cash coming in and whether their products would suddenly lose market etc.

6.1.1 Value of Cash

To begin the discussion on the value of cash, we start by asking the simple question of What does \$1 worth?

- The MM answer is: \$1 inside the firm is worth \$1 outside the firm. The MM theorem assumes a complete market (aka **no friction**). E.g., if I have an idea worth \$1, it is worth \$1 even if I have no cash because it assumes that I can get the \$1 from the investor.
- Intangibles could be more or less than \$1 though. In real life, because there is frictions (e.g., cost to raise the \$1), \$1 in the firm can be worth more or less than that outside the firm.
- Literature: a study done by J Applied Corp Fin (Pinkowitz & Williamson) used 40 years of data and 12,888 companies to construct a statistical money of adding \$1 extra cash to a firm’s balance sheet. The conclusion is \$1 is worth \$1.04, although the number varies between industries (computer industry is worth \$1.50, whereas in coal industry it is worth -\$1.0).

6.1.2 Value of Cash in a Dynamic Policy

Next we consider the value of cash in a dynamic policy. Refer to the Simul Corp from Ch. 14 of the textbook. In this case, the firm does well from 2001 to 2002, but lost money in 2003. When the ebitda first became negative, the firm chose to keep the investment constant and drew the money from cash reserve; the next quarter with a negative ebitda, it reduces the investment; the third quarter, it raised new equity. Then the firm recovered and returned to the target investment and cash.

Summary: when firm does not do well: first draw down on cash balance; then cut down on investment; when things go bad raised equity.

Frictions of money coming in: obviously there is direct and indirect cost in issuing equity. The indirect cost is much bigger than the direct cost. Also the spread is very high when issuing a small amount (say \$1 million), and it is lower at around \$10 million, so there is a lumpy effect that you want to issue equity in a certain amount.

There is also costs in holding cash like corporate taxes (refer to Ch 14 for more details).

To summarize, a buffer of cash has value:

- There is uncertainty on cash flow;

- We want to avoid to issue equity;
- The buffer saves us the value of liquidity.

But a buffer has costs: the return shortfall relative to cash in the hands of investors.

A small buffer has a high marginal value, low marginal cost. A large buffer has a low marginal value and high marginal cost. So the question because to find the right target size for the buffer.

6.2 Assignment 1: Simulation of Corporate Profits, Investment and Financing

We are given a spreadsheet that describe the history of a firm. The gross operating profit is random. Capital expenditures, dividends paid and equity raised are choice variables. Basically we need to decide the three terms. The cash has to be positive. Assume that you own the firm at the beginning, so you keep the value of the stock (original equity), and the value of the dividends that you pay yourself.

Change item 21 and 22 (a fixed policy for all periods) in the parameter inputs tab of the spreadsheet.

We will try out this example for a couple of weeks, and the final assignment will be a small write-up of the strategy.

Also refer to the memo section of Stellar for more details of this assignment.

For now each person submit his or her own copy of results (in percentage) by this Friday.

6.3 Discussion: Grosvenor Group Ltd Case

Grosvenor Group Ltd is a global property development and investment firm.

- The first question to ask is always what are the competitive advantages of this firm. In this case: expertise in local operations and knowledge, long-term strategic view of markets, reduce the overall risk to the portfolio.
- Risk factors:
 - illiquid nature of real estate investments;
 - Transaction costs such as brokerage commissions and taxes amount to several hundred basis pts;
 - A time delay between action and reaction;
- Why diversified internationally? Reducing risk.
- Management groups: international holding company decides how to allocate funds among the four subsidiaries. The holding company is nothing except a cash allocator, which is like a financial firm.
- Does these indexes match this firm's observation?
- Derivative or not? Active management and passive investment should be the things to consider before derivative. The derivative is only an liquidity and management fee issue.