CSC VOLUME 1 NOTES

CHAPTER 7: DERIVATIVE SECURITIES

Derivatives are investment products that derive value from an underlying asset or security (e.g., an option that derives its value from an underlying stock, currency, an index, or a real asset like gold).

Knowledgeable investors use derivatives to reduce the risk of an underlying asset's future position. They can also be used to speculate on the value of the underlying asset.

Derivatives can include ***embedded options*** (e.g. bond features such as conversion privileges, retractability, and extendability) though this is not a focus in this course.

The two categories of derivatives are ***options*** and ***forwards***. Derivatives may vary within these categories.

- **Option:** A contract between a buyer and a seller:
  - The buyer has the buying or selling rights for an agreed upon amount of an underlying asset at an agreed upon price sometime in the future. This does not have to be exercised.
  - If the buyer wishes to exercise his or her right, the seller must complete the transaction.
  - An owner of a ***call option*** has the right to buy the underlying asset.
  - An owner of a ***put option*** has the right to sell the underlying asset.
- **Forward:** A contract between a buyer and a seller in which both parties must complete a transaction for an agreed upon amount of an underlying asset at an agreed upon price sometime in the future.

MARKETS

Derivatives trade on over-the-counter markets (OTC) and exchanges. There are distinct differences between trades of derivatives on the OTC and exchanges.

Over-the-Counter (OTC) Derivative Market

A market mainly made up of financial institutions (e.g., banks) trading with each other and large corporate clients.

Transactions are made by dealers/brokers directly over the phone and computers, not in person.

Open 24 hours, including weekends and holidays.

Loosely regulated.

In most cases, a performance bond is not required.

Delivery or cash settlement are common.

A fee is usually built into the price of the transaction.

Gains and losses are normally settled at the end of the contract.

Contracts are specifically designed with special features for particular types of risks and strategies.

OTC derivatives can be more complex than exchange derivatives.

These contracts are for large amounts beyond the scope of individual investors. The OTC market is growing as more institutions ***construct products*** to meet their particular needs.

Exchange-traded Derivative Market

Derivative contracts are traded on a trading floor, an electronic trading system, or both.

Regulations for trading are made and enforced by the exchange.

Contracts are standardized.

Commissions are visible, rather than built into the price of the transaction.

Performance bonds are required.

Gains and losses accrue daily.

Rare for delivery to occur.

These exchanges were created due to standardization, credit risk, and liquidity issues of the OTC market.

Derivative exchanges in Canada:

- The ***Bourse de Montreal*** (also called Bourse).
- The ***Winnipeg Commodity Exchange*** (WCE)

Exchange-traded Futures

- In Canada, the WCE lists agricultural futures contracts like canola, flaxseed, wheat, and barely, and the Bourse lists financial futures contracts like single stock and bond futures, ten-year government of Canada bonds, banker's acceptances, and the 30-day overnight repo rate.
- The Bourse is the only financial futures contract listing in Canada.
- Futures have grown in Canada. For example, in 1998, the total number of futures

contracts cleared through the CDCC was 9,143,000. In 2002, the total was 14,657,773.

Exchange-traded Options

- Exchange-traded options are listed on the Bourse in Canada.
- As a risk aversion tool, options have become very popular. For example, in 1998, 5,616,349 options were traded in Canada and by 2002 that number rose to 6,541,325.

HOW TO READ A DERIVATIVE QUOTE

Option quote: Following is a sample of a derivative quotation for an option as it may appear in a financial newspaper.

Note: The small numbers refer to footnotes explained immediately following the quotation. They would not appear in the paper

CDCC Equity Option Quotations						
[1]**Series 4 DAO Inc.**	[2]**C**	[7]**Bid** [3]**15.50**	[8]**Ask**	[9]**Last**	[10]**Vol** [4]**Opt Vol 420**	[11]**Op Int**
[5]Feb.	[6]$15.25	3.20	3.40	3.35	55	1600
	[6]$15.25**P**	2.25	2.50	2.40	10	3100
[5]May	[6]$16.75	1.80	2.00	1.90	40	3300
	[6]$16.75**P**	1.35	1.50	1.45	35	1090
[5]Aug.	[6]$19.00**P**	1.55	1.75	1.70	280	1010

Explanation of Footnotes

(1) Name of company (i.e., the option's ***underlying equity***).

(2) The currency the equity trades in. C = Canadian

(3) ***Closing market price*** of underlying equity.

(4) ***Total trading days volume*** in all series (55 + 10 + 40 + 35 + 280 = 420)

(5) The ***expiration month*** of the option (i.e., February. May, August).

(6) The ***exercise price*** (sometimes called ***strike price***) of each series. **P** represents a ***put***. When no letter appears, it is a ***call***.

(7) The ***closing bid price*** for each option, expressed as a per share price.

(8) The ***closing asked price*** for each option, expressed as a per share price.

(9) The price of the contract traded (also called the ***sale price***) expressed as a per share price. For example, $3.35 was the last price for the March calls.

(10) The number of contracts traded that day, (e.g., 55 contracts of the March calls representing 5500 underlying shares [55 x 100]).

(11) The ***open interest.*** This is number of contracts outstanding that have not been closed out or exercised. The larger the number, the more liquid the series.

Futures quote: Following is a sample of a derivative quotation for a future as it may appear in a financial newspaper.

Note: The small numbers refer to footnotes explained immediately following the quotation. They would not appear in the paper.

Futures Quotations								
[2]**Contract High**	[3]**Contract Low**	[4]**Month**	[5]**Open**	[6]**High**	[7]**Low**	[8]**Settled**	[9]**Change 1**	[10]**Open Interest 2**
[1]**Wheat 5000 bu Cents Per Bushel**								
441	366	Mar 05	410	410	410	402	-12	3253
430	377	May 05	406	406	406	404	-7	88
400	330	July 05	395	395	397	392	-6	1357
[11]**Est Sales**		[12]**Previous Sales**		[13]**Open Interest 2**		[14]**Change 2**		
39860		43295		122954		- 768		

Explanation of Footnotes

(1) Underlying interest. Prices are based on 5000 bushels.

(2) Contract's highest price since it began trading.

(3) Contract's lowest price since it began trading.

(4) Contract's delivery month (e.g., March 2003).

(5) That day's opening price for the contract (e.g., the March 2005 contract opened at 410 or $4.10)

(6) That day's highest trade for the contract.

(7) That day's lowest trade for the contract.

(8) That day's closing price for the contract.

(9) The difference between that day's closing price and the previous day's closing price (e.g., March 05 future closed down 12% from the previous day).

(10) The open interest in the contract.

(11) The trading day's estimated volumes.

(12) The previous trading day's estimated volumes.

(13) The number of futures open on the underlying interest.

(14) The difference between that number of futures open that trading day versus the previous trading day.

CHAPTER 12: HEDGE FUNDS

WHAT IS A HEDGE FUND?

- It is difficult to create a single definition that includes all hedge funds, therefore, hedge funds should be thought of as a type of fund structure rather than a single fund strategy.

- In general, hedge funds can be described as pools of capital that are free from the traditional mutual fund regulations, and therefore have the ability to use alternative investment strategies to generate returns.

- The first hedge funds were introduced as limited partnerships. More recent hedge funds have been structured similar to mutual fund trusts.

- As a sign of their commitment and to align their interest with the other investors, hedge fund managers or the general partner, in the case of a limited partnership, invests a significant amount of his/her own capital in the fund.

- Manager ability and skill is more important in hedge funds than in almost any other investment vehicle.

- 80% of the returns generated by the hedge fund is attributed to the skill of the manager, while only 20% of the fund's return is attributed to the market.

- Hedge funds seek to generate returns from many alternative investment strategies, including long and short positions, derivative strategies and leverage, and arbitrage.

Comparing Hedge Funds to Mutual Funds

- **Basic Similarities:**
  - Hedge funds and mutual funds are both pooled investments.
  - Investors can face either front-end or back-end sales commissions.
  - Management fees are charged by both hedge funds and mutual funds.
  - Investors can purchase or sell both through an investment dealer.

Comparison of Mutual Funds and Hedge Funds	
Mutual Funds	**Hedge Funds**
Restricted to long positions only	Long and short positions permitted
Can use derivatives only to hedge risk	Unrestricted use of derivatives
RRSPs, subject to the foreign content rule	May or may not be RRSP eligible depending on funds structure
High degree of liquidity	Liquidy risk is a key consideration, restriction may be imposed by the manager
Sold by prospectus to investors	Sold by Offering Memorandom to accredited investors only
High degree of regulatory oversight	Lower degree of regulatory oversight
Fees based on assets not performance	Performance-based incentives are common
Portfolio manager's personal assets are not invested in the fund	Significant investment of personal assets made by the fund manager or general partner
Performance is evaluated ***relative*** to a returns particular benchmark	Fund objective seeks to earn ***absolute*** under all market conditions.

Who Can Invest in Hedge Funds?

- In Canada, only "**sophisticated investors**" or an "**accredited investor**" can invest in hedge funds.

- No prospectus is needed in Ontario, Nova Scotia, Quebec, and Saskatchewan, when:
  - the fund is purchased by a sophisticated investor;
  - the investment is over $150,000 (the minimum acquisition cost varies by province)

- Hedge funds can be bought for an acquisition cost of less than $150,000 if the investor is considered to be an **accredited investor**.

- An Investment Advisor must verify the purchaser's status as an accredited investor or sophisticated purchaser prior to confirming any trade.

- Institutional and sophisticated individual investors with a high net worth are eligible to be classified as accredited investors.

- Accredited investors are thought of as being in a position to understand and accept the risks associated with private placement investments such as hedge funds and a prospectus is not required.

- Hedge funds in general are subject to much lower minimum initial and ongoing investor information requirements and thus issue only an **offering memorandum**, which outlines the objectives, risks, and terms of investment.

The Retailization of Hedge Funds

- The trend has been to increase the general public's access to alternative investment strategies through closed-end funds, mutual funds and commodity pools.

- Due to lower minimum investment levels, the general public has access to closed-end funds that use alternative investment strategies.

- In some cases, these closed-end funds are offered as bank notes that offer a guarantee of the principal along with potential for enhanced returns.

- Some mutual funds have received an exemption from the restriction on short sales, which now allows them to seek returns by employing long/short strategies (market neutral strategies).

- Commodity pools or managed futures funds, which use advanced derivative strategies, can also be sold to the general public in a mutual fund format.

History of Hedge Funds

- Alfred Jones is regarded as the pioneer of hedge funds, combining long/short positions as a way to offer protection in falling markets.

- Jones' belief was that performance is based on superior stock selection, not market movement, which is the general strategy for all hedge funds.

- Hedge fund, strategy is based on identifying and purchasing undervalued securities that will outperform the market, while at the same time shorting overvalued securities that are expected to fall in value.

- A successful portfolio manager using this strategy can profit in any market environment, whether rising or falling.

- Leverage is used to augment portfolio returns.

- Initial funds were structured as general partnerships, compensation was linked to performance and the manager invested his own money in the funds and mainly applied a long/short strategy.

- New hedge fund styles have emerged, including arbitrage funds, event-driven funds, and macro funds.

PORTFOLIO THEORY AND HEDGE FUNDS

- Modern portfolio theory is based on the concept that adding securities that are unrelated (i.e., have low correlation) to a portfolio can lower the total portfolio risk while not reducing its expected return.

- The three aspects of modern portfolio theory are:
  1) Correlation, which indicates diversification.
  2) Standard deviation, which indicates total portfolio risk.
  3) Expected return, which is the weighted average return for all securities held in the portfolio.

Framework for Using Hedge Funds

- **Expected Return**
  - The expected return of a portfolio is equal to the weighted average return for all securities held in the portfolio.
  - ***Formula***:

$$E(R) = w_1 \times R_1 + w_2 \times R_2 + \ldots. + w_n \times R_n$$

Where: E(R) = expected return of the portfolio

w_1 = weighting of security 1.

R_1 = expected return for security 1

w_n = weighting of security n

R_n = expected return for security n

  - For example: assume a portfolio contains three assets, A, B, and C. The expected return for the assets are, 10%, -5%, and 4% respectively.
  - To calculate the expected return for the portfolio, weigh each asset as follows: asset A weighted at 35%, asset B weighted at 40%, and asset C weighted at 25%.
  - The expected return of the portfolio would be: [10% × 0.35] + [-5% × 0.4] + [4% × 0.25] = 2.5%.

- **Portfolio Risk**
  - Total portfolio risk is measured by the standard deviation of returns. Total risk includes both market (systematic risk) and unique business risk (specific risk).

- **The Sharpe ratio (Risk-adjusted Return)**
  - The Sharpe ratio measures excess return (portfolio return less the risk free rate), per unit of total risk (standard deviation)

  - ***Formula***:

    $$\text{Sharpe} = \frac{E(R) - \text{Risk Free Rate}}{\text{Standard Deviation}}$$

    Where: E(R) = expected return of the portfolio

    Risk Free Rate of Return is equal to the 3-month T-Bill Rate

  - The Sharpe ratio is used to compare the performance of various portfolios, regardless of the risk taken by the manager.

  - A higher Sharpe ratio is preferred and is an indication of superior performance on a risk adjusted basis.

- **Correlation Coefficient**
  - The **Correlation** measure provides a scaled indication of how closely related the return of two securities are over a period of time.

  - The correlation scale has a range between -1 and +1.

  - Correlation of +1 indicates a perfect positive relationship exists between the two securities and their returns will move in a similar direction under the same market conditions.

  - Correlation of -1 indicates a perfect negative relationship exists between the two securities and their returns will move in opposite directions under the same market conditions.

  - A correlation of 0, indicates that the two securities are not related at all.

  - When adding securities to a portfolio, as long as the correlation is less than +1, diversification benefits will exist and the total portfolio risk will be reduced without compromising the expected return.

  - Depending on how a hedge fund's returns are derived, the hedge fund may be highly correlated to bond or equity markets, have low correlation or, in some cases, be negatively correlated.