



ASX

AUSTRALIAN SECURITIES EXCHANGE

Guide to Equity Options for Investment Managers

Additional ways to achieve return and
manage risk in equity portfolios

Contents

1. Introduction	2	7. Strategies for Enhanced Index Managers	40
Objectives of this Handbook	2	Tilting Portfolio Away from Index	40
Why use equity options in portfolio management?	2	Generating Income for the Portfolio	42
		Questions and Exercises	44
2. Liquidity and Market Making	4	8. Strategies for Absolute Return Managers	45
Options Liquidity at ASX	4	Earnings Season Strategies	45
Market Making in Options at ASX	8	Event-Driven Strategies	47
Questions and Exercises	9	Creating Leverage	50
		Questions and Exercises	53
3. Common Strategies for Equity Managers	10	9. Case Studies	54
Increasing the Yield on an Equity Portfolio	10	Reducing Market Risk	54
Protection for Stocks	17	Reducing Specific Risk	56
Reducing Market Impact	19	Deriving Income from Physical Stock	58
Stock Repair Strategy	21	Creating a Substitute for Physical Stock	60
Questions and Exercises	24	Questions and Exercises	63
		10. Answers to Questions and Exercises	64
4. Strategies for Value Managers	25	11. Further Recommended Reading	68
Acquiring Stock at Pre-defined Entry Points	25		
Divesting Stock at Pre-defined Exit Points	28		
Locking in Unrealised Profits and Reducing the Volatility of a Portfolio	30		
Questions and Exercises	32		
5. Top Ten Tips from Brokers	33		
6. Strategies for Growth Managers	35		
Substituting Call Options for Stock	35		
Obtaining Exposure to a Stock at Low Cost	38		
Questions and Exercises	39		

1. Introduction

This Handbook is intended for investment managers who currently manage Australian equity portfolios, and who already have a degree of familiarity with options fundamentals. It is assumed that the reader:

- is familiar with the workings of the ASX equity market
- is familiar with the use of index futures contracts
- has a basic theoretical knowledge of options, without necessarily having practical experience
- is not familiar with the workings of the ASX options market
- is not familiar with the methods employed by options market-makers to create liquidity.

Objectives of this Handbook

The objectives of this Handbook are to enable equity managers to:

- locate the preferred strategy in order to achieve a certain portfolio outcome
- reshape the risk-return profile of the portfolio
- implement an options strategy in the ASX market place
- implement a strategy with lowest possible market impact costs
- avoid common dangers and mistakes in both strategy and implementation
- know how and when to rectify the strategy if the market view proves to be incorrect.

Equity management styles

Various options strategies are suggested, some of which are particularly pertinent to a specific equity management style such as value, growth, enhanced index, or absolute return.

Explanations of strategies are approached in a holistic manner where the whole of the portfolio (underlying and options positions) is taken into account. Case studies are provided to show how to implement and manage these strategies.

Why Use Equity Options in Portfolio Management?

Used in conjunction with an existing portfolio of long stocks, equity options have the potential to:

- **Reduce risk:** by buying put options as protection, or by writing premium income that cushions downside price moves. This can reduce the volatility of your portfolio.
- **Generate extra returns:** by writing options and collecting premium income when your market view is such that you are happy to cap the upside.
- **Reduce market impact costs of acquiring stock:** by accumulating the desired level of exposure via options, and then switching out of options and into the stock.
- **Reduce transactions costs:** by gaining exposure to stocks or an index using options, rather than paying full stock transactions costs.
- **Manage capital gains implications:** because you can effectively sell stock by selling call options, capital gains implications can be managed.

Portfolio construction

Equity options can be invaluable both in constructing a portfolio and in working the stocks.

When building a portfolio of stocks, managers can use equity options in the acquisition phase. For example, buying calls or selling puts can result in the acquisition of stock, and are a method of stock acquisition that can significantly enhance the risk-return profile of the portfolio.

Portfolio performance

The performance of a portfolio of stocks typically depends on three main factors:

- **Stock selection** – which stems from good ideas and research.
- **Portfolio construction through the acquisition of selected stocks** – while seeking to minimise transaction costs and market impact costs.
- **'Working' the stocks in the portfolio** – by managing each stock to maintain the optimal risk-return profile at any point in time.

'Working' the stocks

If, for example, a target exit price for a stock has been set, call options exercisable at that price can be sold to provide additional income for the portfolio. This can improve the return without increasing the risk profile of the portfolio, and may also result in the divestment of the stock at the target price. Alternatively, put options can be bought to provide protection, or to reduce the holdings of a particular stock.

Equity options offer some other interesting opportunities that can make the stocks in your portfolio 'work harder':

- The 90/10 strategy consists of purchasing call options with 10% of the funds available for allocation to a stock, and purchasing cash-equivalent interest-bearing securities with the remaining 90%. This facilitates the twin goals of capital preservation and potential appreciation from a bullish market move.
- Event and earnings season driven strategies. These include strategies focused on capturing dividends, or benefiting from price moves that result from earnings announcements.
- 'Automatic' asset allocation that can be achieved by selling calls at a pre-defined target exit point, or selling puts at a pre-defined target entry point.

Additional resources

This Handbook is designed to be a ready reference source that will allow equity managers to easily identify and implement an appropriate options strategy.

For educational purposes, a 'Questions and Exercises' page is provided at the end of each chapter, and answers are provided at the back of the book.

The ASX website contains comprehensive information about options at www.asx.com.au/options ASX also offers free online introductory options classes at www.asx.com.au/options

This Handbook is not intended as an all-encompassing options trading textbook. Many good textbooks have already been written on the subject, and a recommended reading list is provided at the end of this Handbook.

ASX Risk Assist

ASX offers the 'Risk Assist' program of education, training and advice on equity options to institutional market participants.

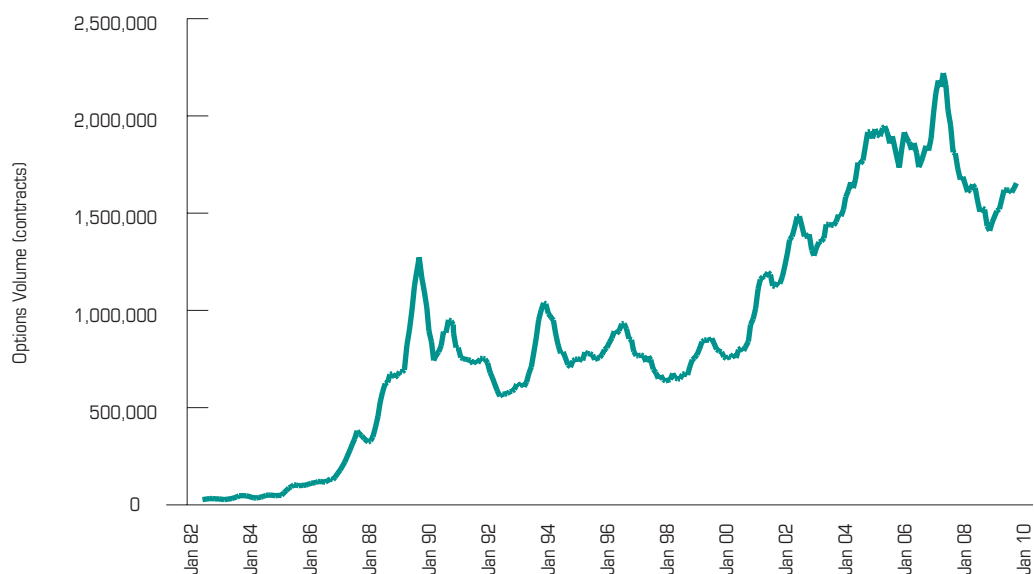
ASX has in-house experts, and retains a number of external consultants, who are available to give advice and training to investment managers who request assistance to learn more about equity options or to use options in the management of their share portfolios.

To find out more about this free program, phone ASX on 131 ASX.

2. Liquidity and Market Making

The volume of equity options traded on ASX has risen strongly over the past few years, and has approximately doubled since 1999. In 2008/09, the notional value of options traded on ASX was approximately \$370 billion.

ASX Options – Growth



4

Options Liquidity at ASX

When trading a specific stock, for example BHP, at any one time there is only one security to consider, at one price. This is in contrast to BHP options where at any time there are approximately 300 options listed. This can be likened to trading 300 different stocks, all with pricing interrelationships, which introduces an element of simultaneous execution risk. It also means that there is a low likelihood that there will be both buyers and sellers in all 300 option series at any one time. Price discovery is more difficult, as it is unlikely that all series will show bids and offers on a continuous basis.

Not all liquidity available in the equity market is visible on screen where electronic trading takes place. Large orders in the equity market may take days to complete, and brokers earn their money finding liquidity for customers. The same is true of the options market.

There is always a price for volume in any market. In the equity market it may take three or four days to execute a trade of 50 million BHP shares, and there will be a degree of market impact cost¹. In other words, it is not possible to truly talk about price without talking about volume. To 'get set' in a large options position may take time, just as it does for a large stock position.

No matter how big the market, whether it is an options market in Australia, in the U.S. or in Europe, the '80/20 Rule' applies: 80% of the volume and liquidity in the options market is in the top 20% of the most highly capitalised stocks.

¹ Market impact cost means how much the price is moved from the current market because of the execution of large volume.

Quantitative measures of liquidity

ASX produces a number of liquidity statistics, as shown in the table below. This table is published on a monthly basis on the ASX website² and gives a snapshot of the top 20 shares in the ASX options market.

One useful statistic shown below is the Derivatives Liquidity Ratio, or 'DLR'. This is a measure of options volume in share-equivalent terms and is defined as the ratio of options traded to shares traded.

RANK	DEC-09	VOLUME	% MKT	OPEN INTEREST	VOL/OP	SHARE VOLUME	DLR
1	XJO	303,989	19.39%	281,130	108.13%	n/a	n/a
2	BHP	127,461	8.13%	148,912	85.59%	225,697,000	56.5%
3	TLS	126,718	8.08%	163,714	77.40%	789,098,000	16.1%
4	LGL	126,554	8.07%	92,107	137.40%	436,486,000	29.0%
5	WBC	55,410	3.53%	66,068	83.87%	155,684,000	35.6%
6	NAB	51,375	3.28%	65,404	78.55%	143,322,000	35.8%
7	ANZ	49,104	3.13%	68,175	72.03%	153,933,000	31.9%
8	CBA	46,243	2.95%	48,247	95.85%	81,146,000	57.0%
9	OSH	33,035	2.11%	30,387	108.71%	128,058,000	25.8%
10	QBE	32,990	2.10%	30,930	106.66%	80,700,000	40.9%
11	STO	32,134	2.05%	29,742	108.04%	84,431,000	38.1%
12	BXB	28,587	1.82%	22,875	124.97%	109,167,000	26.2%
13	AMP	27,893	1.78%	44,380	62.85%	248,637,000	11.2%
14	NCM	26,104	1.67%	19,672	132.70%	45,769,000	57.0%
15	WDC	25,036	1.60%	39,382	63.57%	180,300,000	13.9%
16	GPT	24,609	1.57%	48,454	50.79%	855,376,000	2.9%
17	BSL	23,737	1.51%	28,379	83.64%	309,063,000	7.7%
18	FGL	23,128	1.48%	59,211	39.06%	149,688,000	15.5%
19	AWC	22,905	1.46%	29,348	78.05%	314,637,000	7.3%
20	WOW3	22,093	1.41%	26,692	82.77%	63,775,000	34.6%
Top 5		740,132	47.2%	751,931	98.4%	1,606,965,000	46.1%
Top 10		952,879	60.8%	995,074	95.8%	2,194,124,000	43.4%
Top 20		1,209,105	77.1%	1,343,209	90.0%	4,822,260,000	25.1%
Market		1,567,588	100.0%	1,732,489	90.5%	10,892,095,000	14.4%

Note: XJO is not included for the DLR (Derivatives Liquidity Ratio) estimates and top volumes.

Open interest is another good indicator of liquidity. This measures the number of contracts that have been opened in the market and not extinguished by an equal and opposite trade. Looking at open interest for all options listed over a particular stock is meaningful because pricing interrelationships between related series mean that open interest in one series can drive liquidity in others. When looking at individual series, an open interest of 1000 contracts or more is generally considered liquid.

However, option series with an open position of fewer than 1000 contracts can still be attractive if you intend holding the option to expiry. In this case, there may be no need to trade out of the position.

² See page http://www.asx.com.au/products/options/trading_information/monthly_statistics.htm

Large options trades

The following table shows different measures of liquidity for some of the most actively traded stocks in the ASX options market. All data in the table relates to the financial year 2008/2009. The first and second columns of data show large options trades (500 contracts or more) for the entire thirty month period, and as a monthly average. The third column shows the dollar value of large trades (\$250,000 or more). The final column shows the average total monthly value of all deals of \$250,000 or more.

STOCK CODE	TOTAL NUMBER OF LARGE TRADES (500 LOTS OR MORE)	MONTHLY AVERAGE NUMBER OF LARGE TRADES (500 LOTS OR MORE)	TOTAL VALUE OF DEALS \$250K OR GREATER (\$M)	MONTHLY AVERAGE TOTAL VALUE OF DEALS \$250K OR GREATER (\$M)
XJO	605	50.42	\$473.59	\$39.47
TLS	227	18.92	\$307.36	\$25.61
LGL	109	9.08	\$123.65	\$10.30
BHP	107	8.92	\$2,629.90	\$219.16
NAB	66	5.50	\$761.56	\$63.46
GPT	60	5.00	\$117.29	\$9.77
OSH	47	3.92	\$19.88	\$1.66
WBC	46	3.83	\$399.78	\$33.31
ANZ	45	3.75	\$442.37	\$36.86
WDC	41	3.42	\$259.62	\$21.63
OZL	39	3.25	\$63.85	\$5.32
QAN	38	3.17	\$69.43	\$5.79
BXB	37	3.08	\$238.75	\$19.90
CSR	35	2.92	\$3.84	\$0.32
CBA	34	2.83	\$1,175.03	\$97.92
FXJ	34	2.83	\$6.77	\$0.56
MIG	28	2.33	\$120.30	\$10.03
SGP	28	2.33	\$65.27	\$5.44
TOL	28	2.33	\$62.73	\$5.23
AWC	27	2.25	\$16.81	\$1.40
BSL	27	2.25	\$15.84	\$1.32
Total	1708	142.33	\$7,373.61	\$614.47

When searching for large size liquidity on behalf of clients (where 'large size' signifies an options order that the market could not naturally fill over the course of an average trading day), brokers have various means at their disposal:

- Find matching clients.
- Facilitate by taking the other side of the client's order as principal, then managing that exposure by running a proprietary trading book.
- Ask market makers how much liquidity they are prepared to supply.

3 The term 'strike price' has the same meaning as 'exercise price'. These two terms are used interchangeably throughout this handbook.

Liquidity supply

Unlike the equities market, which is a market that is usually driven by 'natural' orders, the options market has many series listed: often around 300 different strike prices³ and expiry dates in the largest stocks. The market often requires liquidity suppliers to foster price discovery. Liquidity supply can come from three sources:

- i Market Making – professional firms that aim to make money from the bid ask spread or from arbitrage.
- ii Facilitation – where a broker 'facilitates' the execution of an order by taking the opposite side to the client as principal. The broker would usually hold this trade in their house account or proprietary trading arm until the position is closed out on market.
- iii Crossing – where a 'natural' and matching client order is located on the opposite side of the transaction.

Volatility

The volatility of the underlying share price is the main driver of the value of an equity option. Volatility refers to the size and frequency of movements in the price of the underlying shares. Mathematically, volatility is the annualised standard deviation of daily percentage changes in a stock's price.

Since the future value of an option will be determined by the price of the underlying share at a particular point in time in the future, it is the future share price volatility that is important.

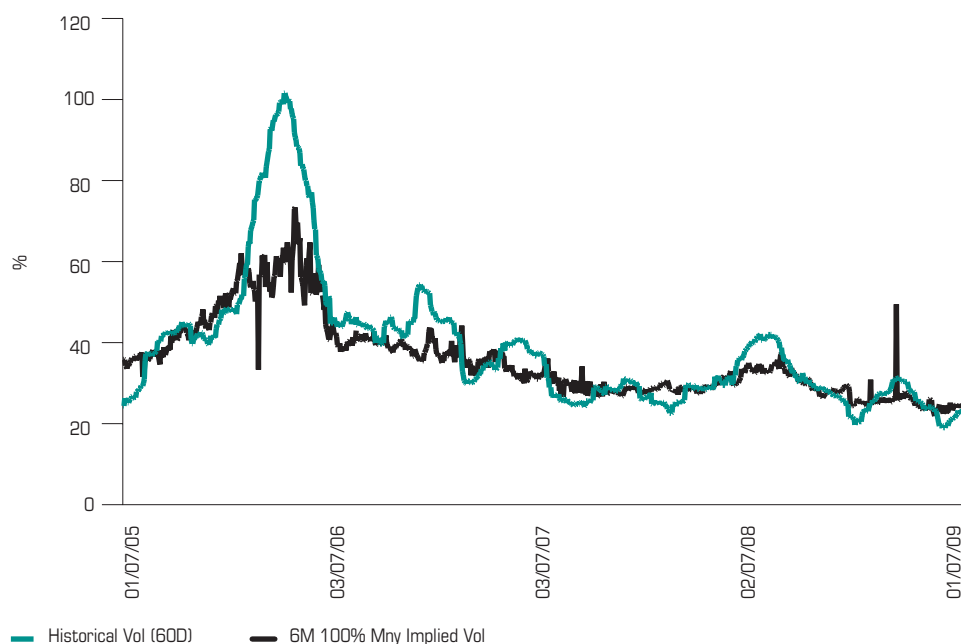
There are two types of volatility, 'implied' and 'historical'.

Implied volatility relates to the current market price of an option. A certain level of volatility is implied from the option's current price, using a standard option pricing model. Keeping all other inputs (such as interest rates, dividends and time to expiry) constant, a trader can put the current price of an option into an option pricing model and it will calculate the volatility implied by that option price. Implied volatility is essentially the market's forward estimate of the volatility of the underlying stock over the life of the option.

This is different to historical volatility, which is the past level of actual volatility observed in a stock over a given period of time. Historical volatility is sometimes used as a guide to the market's forward estimate.

The chart below shows a short-term historical volatility measure (realised volatility) and call option implied volatility for a representative stock, BHP, since July 2005.

BHP Volatilities



As can be seen from the previous chart, there is much variation in volatility over time. Historical volatility is correlated with implied volatility over various periods, however, it can only ever be a rough guide to future volatility.

All else remaining constant, an increase in volatility leads to higher option premiums.

Because volatility is non-directional, both put and call option premiums rise.

Market Making in Options at ASX

In 1997, the ASX options market moved from floor to screen and began trading electronically. An important consequence of this was the physical separation of market makers from one another, which resulted in genuine competition between market makers. Many subsequent advances in trading technologies, both by market making firms and in exchange systems, have resulted in a market today that is highly sophisticated.

At the time of writing, there are around 10 market making firms in the ASX options market, most based in Australia. Market makers compete against one another for order flow. The way they compete successfully is to make the best price (tightest spread) possible. In general, the more market makers there are in competition, the tighter the spreads. Usually, there are up to 10 market making firms competing to make markets in the top 10 stocks.

The prices shown in the options market screen are firm bid and ask quotes from market makers, and the volume shown generally reflects the ASX minimum quantity obligations.

'Natural orders' (i.e.. orders that are not from market makers) are also shown on the screen.

Different types of market makers have different rationales underpinning their activities:

- 1 The traditional motivation of market makers is to make money from the bid ask spread by quoting around the Implied volatility when markets are open, and attempt to be 'square', or fully hedged at the close of trading.

- 2 A second objective can be to make money from options that are under-priced or overpriced (relative to perceived theoretical fair value). Today's electronic market, however, is far more efficient and competitive than it was a decade ago, and this has resulted in significant narrowing of bid ask spreads. Thus the opportunities for profit from exploiting deviations from fair value are few.

- 3 A third objective can be to take a directional view of future volatility. This is unusual because market makers normally aim to hold active long or short positions for no longer than is absolutely necessary.

In general, market makers immediately (within seconds) seek to hedge an exposure created from the sale or purchase of an option.

Different types of market-makers

Delta Hedgers

This is the traditional type of market making where the market makers' exposures are usually hedged into the underlying security or another options series in the same market. Index futures contracts are also used to cover exposure. Firms usually have from as few as two to as many as a dozen individuals making markets, each looking after particular stocks.

Global Exposure Managers

Market makers who participate in other equity options markets globally often make markets in Australia as a result of their global exposure. This exposure could be to a particular sector (for example the banking sector), rather than being confined to a particular geographic region or market. For example, when asked to make a market in Westpac options, a firm could make a market relating not only to the price of Westpac shares but also to whether its global book needs to be longer or shorter in bank sector volatility overall. The market that this firm makes in Westpac options could also be related to its global exposure to equity market volatility generally.

Trading Desks

In Australia, many investment banks have trading desks that manage the exposures created by other areas of the bank, and preferably make money out of those exposures within the bank's limits. For example, as a result of issuing structured products, banks create equity exposures that may need to be hedged. This hedging often takes place in the options market. Another example is a trading desk that manages exposures created from a stock lending business.

Therefore, when a market maker who works on a trading desk makes a market in Westpac, they may well be coming from a position that is not 'square'. Other Westpac exposures may have been given to the trading desk that morning as a result of transactions in other areas of the bank. Over the course of the trading day it is the market maker's job to hedge the exposure. Consequently, this objective will affect the bid ask spread that they quote for a particular option series. For example, if the market maker is given a short Westpac position at the beginning of the trading day, the market maker may skew the bid ask spread so that the long side seems more attractive.

Independent Market Makers

Independent market makers are usually small, independent firms run by two or three individuals. These are market makers that trade for their own profit (i.e. as principal), and usually make markets in two to, at most, six stocks. These market makers usually outsource their clearing and operational activities.

Questions and Exercises

- 1 What is the DLR?
- 2 What is open interest?
- 3 When searching for 'large size' liquidity on behalf of clients (where 'large size' signifies an options order that the market could not naturally fill over the course of an average trading day), brokers have three means at their disposal. Name these three means.
- 4 Liquidity supply can come from three sources. Name these three sources.
- 5 Different types of market makers have different rationales underpinning their activities. Name three ways market makers aim to make profits.
- 6 How long will a market maker generally seek to hold an exposure created by supplying liquidity?
- 7 Describe four types of market makers.

3. Common Strategies for Equity Managers

Equity options are an extremely useful tool in the management of equity portfolios because they have the unique ability to modify the risk-return profile of your portfolio to meet your specific objectives. There are many different applications for equity options, all of which result in precise adjustments to the risk-return characteristics of the underlying equity portfolio.

This chapter explores four fundamental equity options strategies that active equity managers may find useful:

- i increasing the yield on an equity portfolio
- ii protection for stocks
- iii reducing market impact
- iv stock repair strategy.

Points to note about all strategies in this Handbook:

- Transactions costs such as brokerage and exchange fees are not included in the examples. The level of interest rates, which has an impact primarily through borrowing costs and carrying costs, has also been ignored for simplicity.
- Examples of option trades typically refer to payoff at expiry. Option prices will be different prior to expiry, as shown by the '30 days to expiry' line in some graphs. This Handbook assumes some knowledge about options pricing, however, if you are unfamiliar with how options are priced you should refer to the recommended reading at the end of this Handbook.
- Comments on tax issues are not to be used as professional taxation advice. This document is for educational purposes only and should not be considered financial product advice nor relied upon for investment purposes. The Australian Securities Exchange does not represent or warrant that the information is complete or accurate. To the extent permitted by law, no responsibility for any loss arising in any way (including by way of negligence) from anyone acting or refraining from acting as a result of this material is accepted by the Australian Securities Exchange.

Increasing the Yield on an Equity Portfolio

One of the most common ways to increase the yield on the stocks in a portfolio is to generate additional income by selling covered calls. A call is 'covered' when the option seller puts stock aside to cover the possible exercise of the option as long as the option position is open.

When you sell (write) a covered call, you receive the option premium. The option premium can be seen as extra income earned from owning those shares. In effect, your shares are 'working harder'.

Keep in mind that if your strategy changes you can buy back the call option at any time.

Because exchange traded options are standardised, they can be bought and sold on market thereby allowing flexibility in initiating or adjusting the investment strategy if circumstances change.

Selling covered calls provides you with extra income, but the trade-off is that the upside potential of your stock holding is capped. This is because as long as the call option position is maintained, you have an obligation to deliver the underlying stock at the exercise price, if the option is exercised by the option holder.

When the option expires

If the share price at expiry is below the strike price of the option, the option will expire worthless, you will retain your shares, and the entire option premium is kept as income. If the share price at expiry is above the strike price of the option, the option will be exercised and you will have to deliver your shares in return for receiving the strike price. Your effective sale price for the stock is the strike price of the option plus the premium you received for writing the call.

Buy write

When the covered call strategy involves the purchase of stock and the simultaneous writing of call options, it is known as a 'buy write'⁴ strategy. In this strategy the purchase of the stock and the sale of the call options are executed as a coupled pair because the investor is seeking a particular risk-return profile.

Writing covered calls

When call options are sold over stock that you already hold, this is known simply as 'writing covered calls' or 'selling covered calls.' This strategy is usually employed when you have a positive long-term view of the stock, (i.e., you are not a seller of the stock) but do not expect significant price appreciation during the life of the option. Out-of-the-money calls are usually sold, with the expectation that the calls will expire worthless.

The risk is that by expiry, the share price will be above the strike price, and you will have to deliver the stock or buy back the options on market, probably at a loss.

When writing covered calls to generate income for your portfolio, it is generally the case that you would prefer to keep the stock rather than have it 'called away'⁵. However, you

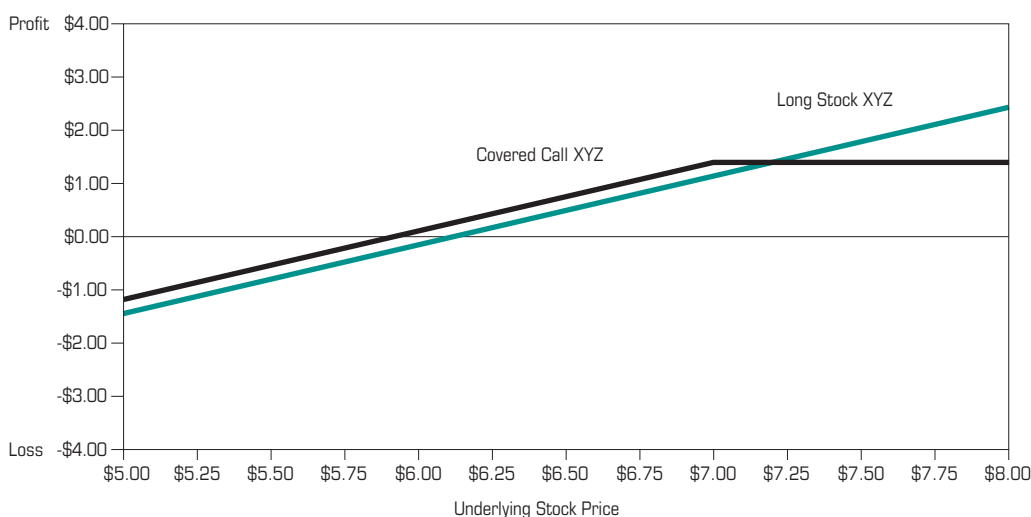
must also be comfortable with the possibility that the option will be exercised and you will be required to deliver the stock at the strike price. It is usually the case that the strike price of the calls chosen is sufficiently above the current market price of the stock to provide an adequate return on the stock should the options be exercised.

Risk-return characteristics of this strategy

The following chart shows the modification to the risk-return profile of the share holding by writing covered calls. In comparison to the long stock position, the writing of covered calls effectively gives up exposure to the share's upside beyond the strike price. In return, the option seller receives premium income which enhances the yield of the portfolio and provides a limited cushion if the share price declines.

Since you retain exposure to a downward movement in the share price, a favourable view on the stock is implicit in the construction of a sold covered call position. However, since you are forgoing the upside exposure above the strike price, your view is not overly bullish for the life of the option. The covered call writer's view can usually best be described as neutral to slightly bullish (assuming that the strike price sold is just out-of-the-money).

Long Stock XYZ vs. Covered Call on XYZ



4 The buy write strategy has a benchmark index in Australia. The S&P/ASX Buy Write Index (ASX code: 'XBW') is a passive total return index. It is calculated by assuming that the S&P/ASX 200 Accumulation Index is purchased and a just out-of-the-money index call option is written each quarter and held to expiry. For further information, see the ASX website: http://www.asx.com.au/research/indices/buy_write_index.htm

5 This objective is different to that explained in Chapter 4 'Divesting Stock at a Pre-defined Exit Point', where the objective is in fact to exit the stock by selling covered calls.

When to use this strategy

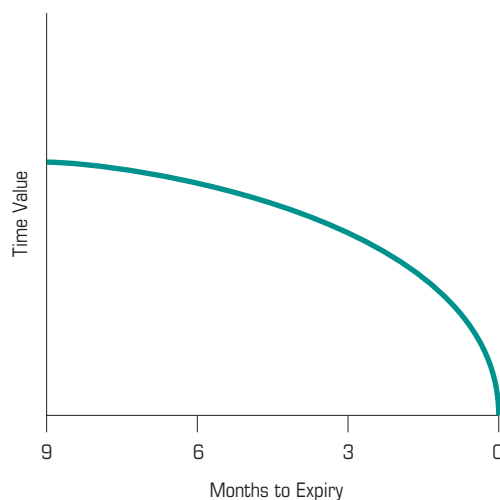
There are various reasons for using this strategy:

- 1 The most common reason is to generate extra income during periods when you expect the market will be flat or falling. In this case, you need to be comfortable holding the stock as a long-term investment, but think that the share price will not rise above the strike price in the short-term. The amount received from selling covered calls represents an additional return on the underlying stock, and therefore a yield enhancement of your overall portfolio.
- 2 Some cushioning against weakness in the stock is also provided by selling covered calls. If you think that weakness in the share price will be severe or prolonged it is normally best to sell the stock. You may, however, wish to retain the stock for reasons such as taxation management or to avoid the transaction costs involved in selling the stock and repurchasing at a later date. In these cases, a decline in the share price would be at least partially offset by the amount of option premium you receive.
- 3 Setting an exit price for your stock holding is another reason to write call options. You receive the premium now, and sell your stock later if the share price is above the strike price at expiry. Your effective sale price is the strike price of the option plus the premium received. The objective of stock divestment at a pre-defined exit price is explored in further detail in Chapter 4.

Which month to sell?

The time value of an option declines as the option approaches expiry. This reflects the shorter time remaining for the stock to exceed the strike price. By the time the option reaches expiry, the time value is zero (see following chart). This process is known as 'time decay'.

Time decay accelerates as the option gets closer to expiry. Around half the time value of a nine-month option will be lost in the last three months, while around half the time value of a three-month option will be lost in the last month.



As a seller of options, time decay works in your favour because the time value of the option, for which you have received the premium, erodes with time. So, other things being equal, it is preferable to sell shorter dated options in order to take advantage of the accelerated rate of time decay.

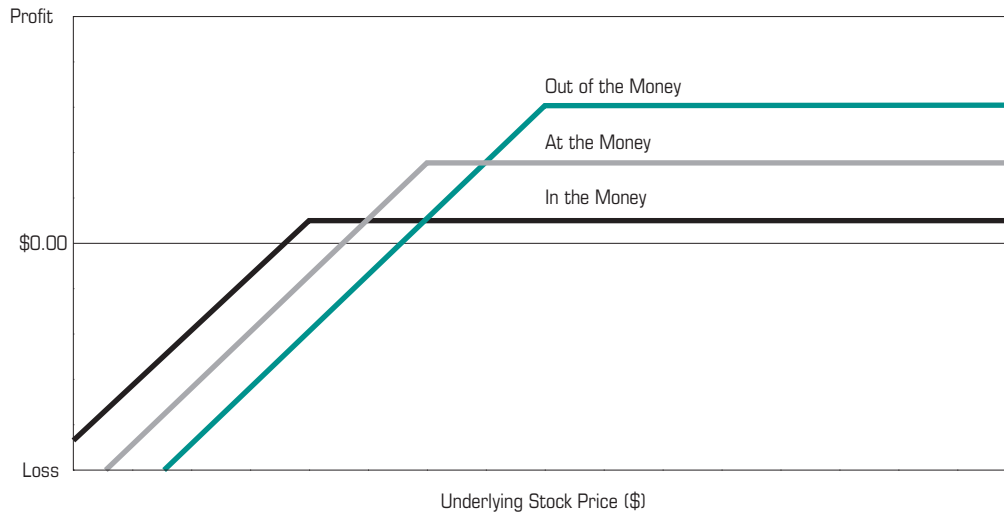
In general, this translates to a rule of thumb for covered call sellers that one month options are often the most desirable, and anything longer than three months should usually be avoided. The choice of expiry month is also affected by the volatility of the underlying stock. The more volatile the stock, the riskier it is to sell longer-dated options, as there is greater potential for a damaging move in the share price.

Which strike price to sell?

Depending on your objective in establishing the position, and your view of the direction of the market, you may choose to sell covered calls that are in-the-money, at-the-money, or out-of-the-money.

All other things being equal, the lower the strike price, the higher the call option premium received. However, this also means that your upside exposure is capped at a lower level. Therefore a balance must be reached between risk and return, that is, between minimising the upside potential forgone and maximising the premium income received.

Selling Covered Calls with Varying Strikes



The balance reached will obviously depend on your view of the likely share price movement during the life of the option. For example, if you think that the share price could appreciate by up to 7% before the expiry date of the option, you would choose a strike price that is around 7% out-of-the-money. This would allow you to capture the premium income without surrendering any of your upside potential.

Selling in-the-money covered calls

In-the-money call options command the highest premiums (see previous chart), but are also the most likely to be exercised. For this reason, if you want to keep your stock, they are not the best choice.

However, selling in-the-money call options is sometimes viewed as an alternative to selling the stock itself, and can have certain advantages. One possible area of advantage is taxation.

Selling at-the-money covered calls

The sale of an at-the-money call covered by a holding in the underlying shares produces a risk-return profile almost identical⁶ to that of a sold at-the-money put⁷. The risk-return characteristics of this position are not as conservative as you might imagine. On the downside, you have equity risk exposure, and on the upside you have limited profitability that is capped at a certain level.

Typically, a conservative investor would want the exact opposite, that is, unlimited upside profitability with limited downside risk capped at a certain level. In fact, the conservative investor achieves this by holding stocks and buying puts for protection (see next section 'Protection for Stocks').

If you sell at-the-money calls against your stock holding you must, of necessity, firmly believe that the share price is not going to fall by more than the premium received. If it does, your losses will mount as the market falls further. The main advantage of selling an at-the-money call is that the at-the-money option is the option with the most time value, and therefore will produce the greatest profit to the option writer if the share price remains steady.

Selling out-of-the-money covered calls

This is the area that is usually of most interest to covered call writers. Typically, investors sell out-of-the-money call options in an attempt to enhance the yield of a portfolio, with the reasonable expectation that the calls will not be exercised.

You are also better off choosing out-of-the-money strikes if you think that the stock may be due for an upward move. The further out-of-the-money you write your calls, the greater the participation you will have in the share price gains. The trade-off is that the premium income will be lower.

⁶ The main difference being that the at-the-money covered-call seller is entitled to dividends whereas the at-the-money put seller is not.

⁷ This is explained by 'put call parity' which holds that a position comprising long underlying shares together with short call and long put nets to zero. That is $+U - C + P = 0$. This equation can be manipulated algebraically so that $+U - C = -P$.

Another advantage of choosing out-of-the-money strike prices is that, as long as the share price remains below the option strike, less position management is required. When lower strike prices are chosen, management of the position can be an issue if the share price moves unexpectedly. Remember that the option may be exercised prior to expiry.

If the share price rises above the strike price, the possibility of the call being exercised becomes more likely as expiry approaches. At this point, you have three alternatives:

- a) wait until the call is exercised, and deliver your stock at the exercise price
- b) buy back the call option on market (possibly at a loss) in order to remove the risk of exercise and therefore retain your stock
- c) roll the position. This means buy back the call and then sell another call option with a higher strike price and/or later expiry date.

Rules of thumb

You may be best placed to implement your covered call writing strategy on the basis of a predefined set of criteria such as:

- i the strike price must be at least 5% (or 10%) above current market levels
- ii the premium must be at least 4% (or 2%) of the current share price
- iii the time to expiry must be no more than 30 days (or 90 days).

For example, assume that your particular set of criteria allows you to write calls only when the strike price is 5% or more above the current share price, the premium is 2% or more of the current share price, and the time to expiry is 90 days or less. In the event that the options are exercised and the shares are called away, you are guaranteed a rate of return of 7% in 90 days, which represents an annualised rate of more than 28% p.a.

There are many such 'rules of thumb'. You will need to be comfortable that the rules you choose are compatible with your portfolio objectives, your risk-return preferences, and your trading style.

What can go wrong?

In general, if you follow a set of rules such as these you will be well placed to enhance the yield of your portfolio in most circumstances. The exception is where there is a strong and sustained rise in the share price, in which case, using the example above, you would still receive a return of 7% in 90 days but you would underperform the strategy of long stocks only. That is, you would suffer the opportunity cost of not receiving returns in excess of 7% in 90 days.

If the share price rises above the strike price, the worst that can occur is that the stock is called away. Since the sold calls are 'covered' through ownership of the stock, there is no physical upside risk in selling calls. The only upside risk is the opportunity cost of having your stock called away in circumstances where you might prefer to keep it.

There is, however, risk on the downside, where an unexpected drop in the share price can result in large losses. The call premiums received provide only a limited cushioning effect in the face of a large drop in the share price. Note, however, that in the event of a fall in the share price you will always be better off having written calls than simply having held the shares alone.

Example

Assume that you hold 100,000 shares of XYZ stock that, in mid July, is trading at \$11.50. You are mildly bullish on this stock and do not particularly want to sell it. Your view is that the stock has good long-term potential but is unlikely to move much over the next two months, and the highest it might reach during this period is \$12.50.

You feel that if the stock were to rise to \$12.50 over the next two months, you would be comfortable selling your holding at this level. Given this scenario, you believe that there is potential to enhance the yield of your portfolio by selling covered calls to generate premium income.

XYZ September \$12.50 calls are trading at \$0.36. You note that this strike price is 8.7% above the current share price, and that the premium represents 3.1% of the current share price. The time to expiry of the option is 67 days.

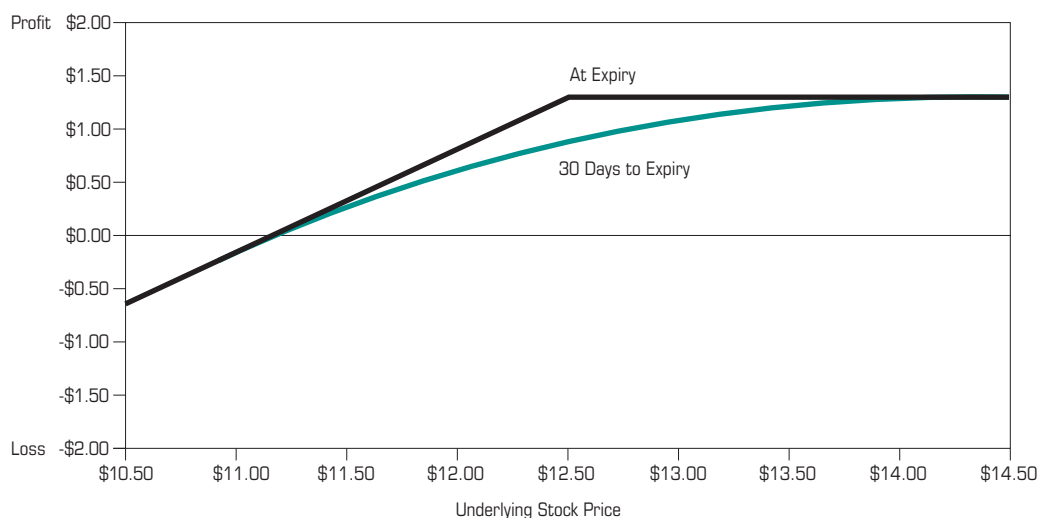
If the options expire worthless, the premiums will have enhanced your yield on this stock by 3.1% in 67 days. Your stock will have been working harder for you. If the options are exercised, this would represent a return on the stock of 11.8% in 67 days (ie. 8.7% + 3.1%). (Commission costs have not been included in this calculation but should be factored into a real world example.)

You implement the following strategy⁸:

Sell 100 XYZ Sept 12.50 Calls @ \$0.36

Writing Covered Calls

Long Stock at \$11.50 + Short \$12.50 Call at \$0.36



There are four possible outcomes

- 1 By expiry in September, the share price has fallen to \$11.23. The options expire worthless and you do not have to unwind your position. You do not pay commissions to exit the strategy. You have enhanced the yield on this stock by 3.1% by the use of the covered call strategy. Despite this the value of the shares has fallen by 2.3%. The net gain is 0.8%.
- 2 By expiry in September, the share price is \$11.94 after having traded as high as \$12.12. The options expire worthless and you do not have to unwind your position. You do not pay commissions to exit the strategy. You have enhanced the yield on this stock by 3.1% by the use of the covered call strategy. In addition, the value of the stock has increased by 3.8% during the 67 day period. The net gain is 6.9%.
- 3 By expiry in September, the share price is \$13.00 and the options are exercised. Your shares are called away at \$12.50 and you have received a return of 11.8% in 67 days. This is 1.2% less than the 13.0% you would have received if you had had a long stock only strategy.
- 4 By expiry in September, the share price is \$13.00. To avoid being exercised, you repurchase the options on the last day for a premium of \$0.50. You lose \$0.14 on the options transactions, however your shares have increased \$1.50 in value over the period. You still have received a return of 11.8% in 67 days, but this is 1.2% less than the 13.0% that you would have received if you had had a long stock only strategy.

⁸ One option contract usually corresponds to 1000 shares. Be aware that where corporate actions occur, contract size may be adjusted. For example if the company issues a 1:10 bonus, existing option contracts may be adjusted to represent 1100 shares. You should always check the contract size with your broker, data vendor or ASX website prior to implementing an options strategy.

Collateral for the covered call position

All written option positions are margined by the Australian Clearing House (ACH). In the case of written call option positions, it is normal practice to lodge the underlying shares as collateral with ACH to cover the short option position. If you do not lodge collateral, cash margins for the short option position will be required.

Points to remember

- 1 Do not use the covered write if you are concerned about being exercised.
- 2 You must be content with the price you will obtain for your shares if you are exercised.
- 3 Assess the strike price in light of the possibility that the options may be exercised, and be sure that the premium received is adequate compensation.
- 4 Remember that the call option can be exercised at any time. You must, therefore, be prepared to lose the stock at the strike price at any time, including before the stock goes ex-dividend.
- 5 If the share price unexpectedly strengthens, you may consider buying back the calls (possibly at a loss) and perhaps rolling the option position by selling more call options at a higher strike price ('rolling up').
- 6 If expiry is approaching and you are concerned about unwanted exercise, you can buy back the calls (possibly at a loss) and perhaps sell more call options at a more distant expiry date ('rolling out') thereby avoiding exercise and potentially increasing the income flow.

Main benefits of the options strategy

- 1 Generates income in flat and falling markets that enhances the yield of your stock holding and of your portfolio.
- 2 Provides limited cushioning in the case of a market fall.
- 3 If the option is exercised, the sale of your shares is achieved at a higher price than the share price at the time of writing the option.

Main risks of the options strategy

- 1 Share price falls dramatically, and the call option premium provides only limited

cushioning. Please note that in the event of a fall in the share price you will always be better off having written call options than simply having held the stock alone.

- 2 Share price rises significantly, and you miss out on the rise because your shares have been 'called away'. This is not a physical cost to you, but is an opportunity cost.

Characteristics of the options strategy

<i>Objective</i>	To earn income from the sale of call options and thereby enhance the yield of your stock holding and of your portfolio.
<i>Construction</i>	Write call options over stock that you already hold.
<i>Market view</i>	Neutral for the duration of the strategy (from mildly bullish or bearish in the short-term to somewhat more bullish in the longer term). Since you are long this stock in your portfolio, there is an implicit positive view on the stock. Nevertheless, you are willing to relinquish upside potential beyond the sold call strike during the life of the option.
<i>Maximum profit</i>	The maximum profit accruing during the life of this strategy is the premium received from the sold calls, plus the difference between the market price of the stock at the time of writing the calls and the strike price of the calls.
<i>Maximum loss</i>	The maximum loss accruing during the life of this strategy is the market price of the stock at the time of writing the calls less the premium received from the sold calls.
<i>Time Decay</i>	Time decay works in favour of the sold call position.
<i>Volatility</i>	Increase in volatility works against the sold call position.
<i>Margins</i>	Cash margins are not required if the underlying stock is lodged as collateral.

Protection for Stocks

When you have a holding in a stock and you are concerned about a possible fall in the share price in the near future, you can protect the capital value of your stock holding by the purchase of put options. No matter how much the market price of the underlying stock decreases during the life of the options, you are guaranteed the right to sell your stock at the strike price of the put option.

This strategy can be useful when you have a long-term bullish view on a stock, but you are concerned about a short-term fall in the price. Without using put options to obtain temporary protection, you only have two choices: either watch the value of your shares fall, or sell them.

Should be used sparingly

Perpetually protecting a stock can be expensive. For example, 12 month at-the-money put options typically cost between 5% and 10% of the value of the shares. In most instances, this would be a large part of your expected return on the stock.

Therefore, it is usually not cost-effective to have protection in place twelve months of the year – this strategy is generally more appropriate for shorter periods when you expect the share price may decline. On the other hand, long-term protection can be considered better value for money because time decay accelerates towards expiry.

Just as in other real-world situations where protection is expensive but necessary, the same is true of equity portfolio management in certain instances. No matter how good you are at picking stocks, there will be occasions when the purchase of put options is appropriate. These occasions will generally be event-driven short-term periods when there is some doubt as to whether the stock will clear the next hurdle unscathed.

Although selling calls is one way to help defray the expense of buying puts, this caps your potential returns. Collaring a stock (buying puts and selling calls) is an effective way to reduce the protection costs of long puts, but is better suited to situations where the stock is already showing a substantial unrealised profit (see Chapter 4, 'Locking-in Unrealised Profits and Reducing the Volatility of Your Portfolio'.)

How much cover is enough?

This depends on how much of a fall your portfolio can withstand. If you are sitting on a large unrealised profit from a stock, a 10% decline in its share price might be something that you can tolerate. On the other hand, in a tighter position your tolerance to short-term set-backs could be greatly reduced.

The choice of put option usually involves balancing the cost of protection (the option premium) against the level of protection provided (the strike price and expiry date).

One alternative is to insure only a portion of your holding.

Example

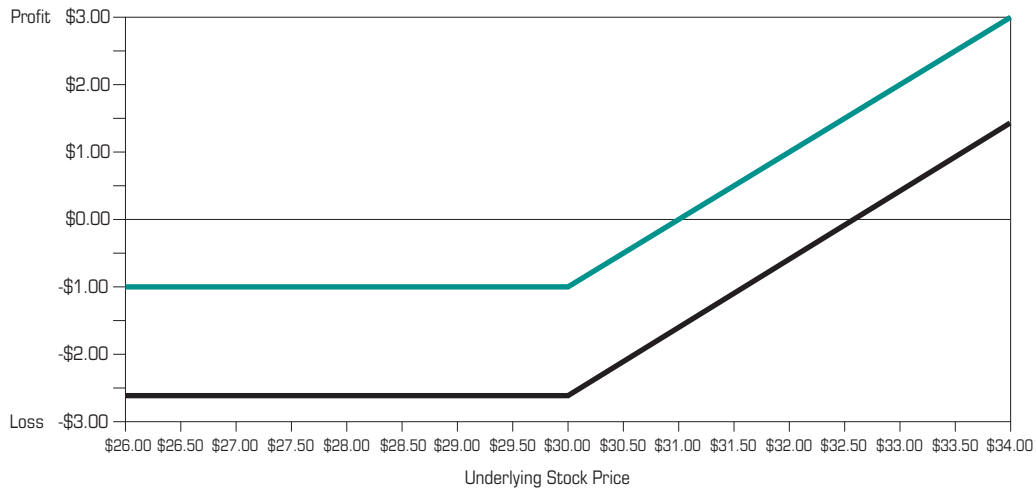
It is January and BBB shares are trading at \$30.00. You own 10,000 BBB shares and are bullish on the stock in the long-term, but think that the next few weeks could see the share price temporarily retreat.

You decide to buy at-the-money puts to protect yourself from the anticipated market dip. Since each option covers 1000 shares, you will need to buy 10 put options in order to protect your holding of 10,000 shares.

Stock protection in the form of February \$30.00 puts is available for \$1.00. In comparison, December \$30.00 puts are available for \$2.60. Whichever put option you choose, your long-term view on the stock should be positive, otherwise you would not continue to hold the stock at all.

The graph on the next page illustrates the breakeven points at expiry for buying a short dated February \$30.00 put (in green) and long dated December put (in black). While offering protection for a longer period, the longer dated puts significantly increase your breakeven point (from \$31.00 to \$32.60).

Protection for Stocks



You decide to purchase 10 BBB February \$30.00 put options for \$1.00. Your total outlay is \$10,000 to protect a holding worth \$300,000.

At options expiry in February, BBB has fallen to \$28.50. You have two choices:

- 1 exercise (some or all of) the options and sell (some or all of) your share holding at \$30.00
- 2 sell your put options for \$1.50 and retain your shares.

The choice you make depends on whether you want to continue to hold your BBB shares. In either scenario, your \$1.00 worth of protection has returned \$1.50, and the value of your portfolio has been enhanced compared to the 'no protection' strategy. For simplicity, this example does not take account of commissions, but these should be factored in to a real life situation.

Note that you do not have to wait until expiry to either exercise or sell your options.

However, if you do nothing, and if at expiry the share price of BBB has risen above \$30.00, your options will expire worthless (costing you \$1.00), but you would be showing a further profit on the shares.

Points to remember

- 1 Stock protection can be useful when you have a long-term bullish view for a stock, but are concerned about a short-term fall in the price. In this instance, stock protection helps to reduce risk.
- 2 Stock protection for long periods can be expensive.
- 3 If you think that the share price decline will be sustained it is preferable to sell your holding of the stock.
- 4 Balance the cost of the protection (the option premium) against the level of protection provided (the strike price and expiry date chosen).

Main benefits of the options strategy

- 1 Put options enable you to protect the value of your shareholding during the life of the option.
- 2 Your profit potential is not limited since if the share price rises, you still benefit from the increase in value of your shares.

Main risks of the options strategy

- 1 Protective puts offer high cost protection: it is usually not cost-effective to have protection for long periods. The strategy is generally appropriate for shorter periods where you anticipate that the share price may decline.
- 2 Time decay erodes the value of the bought option.

Characteristics of the options strategy

<i>Objective</i>	To protect the capital value of your stock holding during an anticipated short-term decline in the share price.
<i>Construction</i>	Buy puts with a strike price at-the-money or out-of-the-money depending on your market view.
<i>Market view</i>	Cautiously bullish. Your view is that the share price will rise in the longterm, but you are concerned about a possible fall below the strike price in the short-term.
<i>Maximum profit</i>	Unlimited. You will profit from an increase in the share price.
<i>Maximum loss</i>	The premium of the bought puts, plus the difference between the current price of the shares and the strike price of the put option. (In contrast, without the bought puts as stock protection, your maximum loss on the share holding is the current price of the stock.)
<i>Time Decay</i>	Time decay erodes the value of the bought puts.
<i>Volatility</i>	An increase in volatility works in favour of the bought puts.
<i>Margins</i>	No margins are payable on bought options.

Reducing Market Impact

Market impact can be a problem for investment managers. When buying a large quantity of shares, the effect of market impact means that you will have to pay a higher price because your trading activity causes the market price of the stock to rise while you are buying it.

Market impact is a key consideration for investment managers preparing to execute any order to buy or sell a large quantity of shares. In some cases the potential impact can be as great as several percentage points. Costs of this magnitude need to be carefully assessed

alongside other transaction costs such as commissions and the bid ask spread.

Due to the adverse effects of market impact, investment managers sometimes spread their large orders over a few days or even weeks. In other circumstances, managers need to divulge their interests or intentions to a broker in order to allow the broker to search for a natural counterparty. This also has the potential to result in increased costs. Managers can also split their order into smaller lots that they channel through several different brokers.

How can options help?

The options market provides an additional pool of liquidity that can be used for acquiring stock positions. Accumulating exposure via options can reduce market impact costs of acquiring stock.

As outlined above, there are various methods of building up exposure to a stock while in the process of executing a large order. Buying call options is another way of obtaining that exposure.

By buying calls on the options market, you are not generating direct market impact pressure in the underlying share market. Different call option series on the stock can be bought (different months and/or different strikes), thereby spreading the market impact within the options market. In addition, market makers and arbitrageurs ensure that the options market remains fairly priced in relation to the underlying share market.

Strategy

In order to implement this strategy, it is necessary to calculate the number of call options required to give the desired amount of effective exposure to the stock. This is done by 'delta weighting'⁹ the options position to match the desired stock position. This is also known as the 'hedge ratio'.

You then begin purchasing call options. Once the desired level of exposure to the stock has been gained through the purchase of options, you begin to unwind your options position by 'switching' into shares. That is, sell the options on the options market while simultaneously buying the shares on the equities market, all the while being careful to maintain the correct hedge ratio between the two positions.

⁹ For example, if the delta of the options is 0.5, in order to gain equivalent exposure of 10,000 shares, you would need to buy 20 call option contracts (20 contracts x 1000 shares x 0.5 = 10,000 shares). If the delta is 0.8, you would need to buy 1.25 times as many call options, etc.

Note that this is a different treatment than if you were to acquire the stock by buying calls and exercising these options. In the case where you exercise calls and take delivery of the stock, the at-expiry delta of the calls is 1, and therefore the hedge ratio is 1.

Even when not intending to exercise the call options, managers, in practice, do not always delta weight their positions. By buying 'one for one', and then switching out on the same basis, this effectively assumes a delta of 1.

Implementation

Buy calls to establish an options position that provides the desired effective exposure to the underlying share.

Once you obtain the desired effective exposure, you immediately begin buying the physical stock on the equities market. As you buy the stock, you simultaneously unwind your options position by selling the calls, being careful to maintain the correct hedge ratio.

However, your activity in the physical share market may still create a market impact. As you buy the stock, the price may begin to rise slightly. In this case, since you already have the options exposure in place, you are not disadvantaged, as the value of the call options will increase in line with the rise in the share price. In such a delta-weighted portfolio, any gain in the value of the shares due to a rise in share price would be approximately offset by a rise in the value of the bought calls.

As the delta changes with the change in the stock price and the time to expiry, the position needs to be constantly adjusted to maintain the hedge in the correct proportions.

Once you have unwound your entire option position, you will have completed your switch into the physical shares. Your effective entry price to the stock will be the market price at which the stock was trading at the time that you established your options position, plus the net cost of buying and selling the options. The options may have lost a small amount of time value during the period that you held them, but the main cost will be the transactions costs on the options, which are payable on entry and on exit.

Points to remember

- 1 Consider the strategy when you are concerned about potential market impact costs from the purchase of a large number of shares.
- 2 You will have a choice of strike prices, all of which will have different deltas.
- 3 Be sure that you correctly calculate the delta weighting of the options in order to obtain the desired level of effective exposure.
- 4 If you hold the options to expiry with the intention of exercising, you do not need to make the delta calculation. In this case, however, your effective purchase price for the shares will be increased by the amount lost through time decay of the options.
- 5 Be sure that you maintain the correct delta weighting as you unwind your options position by switching into shares.

Main benefits of the options strategy

- 1 Reduces market impact by obtaining exposure to the share price via call options.
- 2 Limited loss potential – if the share price collapses while you are holding the calls, your maximum loss is the price of the premium.
- 3 Unlimited profit potential – if the share price soars while you are holding the calls, your exposure to the share price increase is already established and so your maximum profit is unlimited.

Main risks of the options strategy

- 1 Factor in transactions costs – commissions and fees are payable on purchase of the calls, and again on switching into stocks.
- 2 You will suffer from a small amount of time decay during the period between implementing the options position and switching it into shares.

Characteristics of the options strategy

<i>Objective</i>	To reduce market impact costs.
<i>Construction</i>	Buy calls to establish effective exposure to the underlying shares.
<i>Market view</i>	Bullish.
<i>Maximum profit</i>	Unlimited.
<i>Maximum loss</i>	Cost of premium.
<i>Time Decay</i>	Time decay works against bought calls. However, if operation is carried out relatively quickly, effect of time decay is small.
<i>Volatility</i>	Increase in volatility works in favour of bought calls.
<i>Margins</i>	No.

Stock Repair Strategy

The stock repair strategy is designed to allow you to break-even on a losing stock position. It does not require investing more cash or increasing the risk of the position.

This strategy is appropriate only in certain circumstances, and its suitability will depend on your view of where the share price is headed. If you think that the share price will continue to go down, the best thing to do is to sell the stock.

If you are still bullish on the stock, then 'averaging down' by buying more stock might be the best course of action. Naturally, this would expose you to the possibility of additional losses if the share price continues to decline.

The stock repair strategy is appropriate in the situation where you think that the share price might make a partial recovery, and if it does, you would be happy to exit your position at break-even.

Objective

The aim of the strategy is to break-even without assuming any additional risk. The beauty of this strategy is that it costs nothing to implement, and does not increase the risk of your position. That is, if you are wrong, and the share price does not make a partial recovery, you will be no worse off than if you had not implemented the strategy. If you are right, and the share price does make a partial recovery, you will recoup some or all of your losses, and the amount recouped will always be greater than could have been achieved by continuing to hold the stock position alone. If the share price rises significantly, your upside is capped.

Implementation

Implementation of the strategy is as follows. For every 1000 shares held, buy one at-the-money call and sell two out-of-the-money calls. The strike price of the sold calls is selected so that the premium income received covers the cost of the bought call, that is, the net cost of implementation is zero. Note that all of the sold calls are 'covered': half by the physical shares, and the other half by the bought calls. This means that there is no upside risk in the event that the share price rebounds strongly.

Example

In June, you buy 100,000 shares in ABC Limited for \$5.00. Over the following two months, the stock falls to \$4.00. You believe the stock has been oversold, but you are not confident that the share price will recover to \$5.00. If the share price were to make a partial recovery, you would be happy to exit at breakeven.

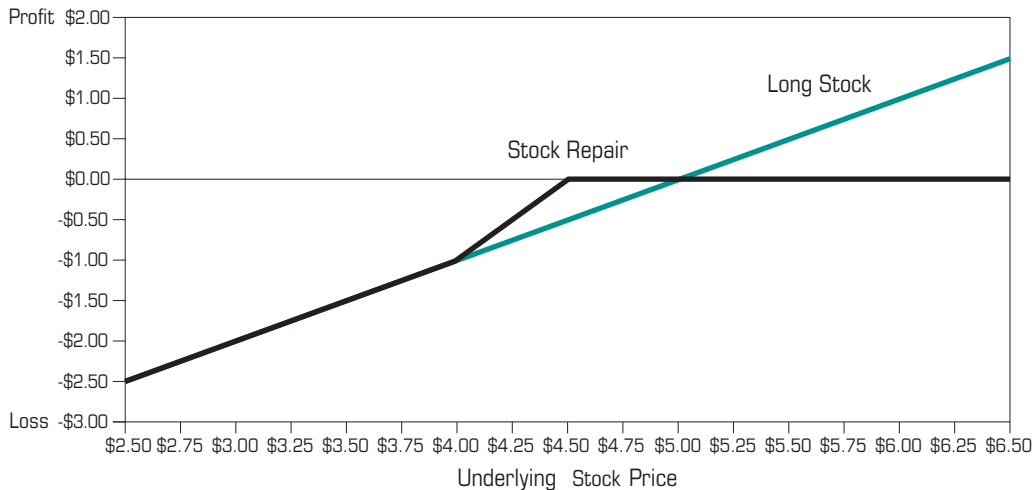
In August, you implement the stock repair strategy as follows:

Buy 100 ABC October \$4.00 calls @ \$0.30
Sell 200 ABC October \$4.50 calls @ \$0.15

Implementation of this strategy is revenue neutral because the premium paid for the bought call is equal to the premium income received for the two sold calls. For simplicity, transaction costs are not included in this example, but must be considered in the analysis of a real situation.

Stock Repair Strategy

Long Stock at \$5.00 + Long \$4.00 Call at \$0.30 + Short \$4.50 Call at \$0.15 x 2



In October when the options expire, there are three possible outcomes:

- 1 If the share price is above the strike price of the sold calls (\$4.50), you will need to close out one or both of the written legs. (You may allow one of the sold call options to be exercised in order to exit your stock position. Otherwise, you can sell your stock on the market.) The bought call will also need to be closed out to recover intrinsic value. In this instance, you will have recouped all your losses and exited at breakeven.
- 2 If, at expiry, the share price is above the price of the bought call (\$4.00), but below the price of the sold calls (\$4.50), the sold calls will expire worthless, and the bought call will need to be closed out to recover intrinsic value. Simultaneously, you sell your stock on the market. In this instance, you will have recouped some but not all of your losses, and exited the stock with a more favourable net position than if you had not employed the stock repair strategy.
- 3 If, at expiry, the share price is below the price of the bought call (\$4.00), all the options will expire worthless, and you will not have reduced the losses on your stock position. The strategy did not improve your position because a partial recovery in the stock price did not eventuate. However, you are no worse off than if you had not employed the stock

repair strategy. At this time, you may choose to exit your stock position on the market, or you may choose to implement the stock repair strategy again.

Points to remember

- 1 The aim of the stock repair strategy is to exit your losing stock position at break-even.
- 2 The strategy can be used when you think that the share price might make a partial recovery.
- 3 If the share price rises, break-even point is reached sooner than it would be by holding the stock alone.
- 4 Break-even point is usually reached by the time the stock has moved about half-way back to where you bought it.
- 5 The strategy should not be used if a strong upward movement is expected because you will not participate in profits if the stock price moves above your entry point.
- 6 The strategy does nothing to alleviate further losses on the stock if the share price continues to fall.
- 7 If the strategy is implemented at zero cost, the downside risk of the overall position is identical to that of the long stock position alone.

Main benefits of the options strategy

- 1 The stock repair strategy allows you to break-even (or recoup some losses) on a losing stock position if the share price makes a partial recovery.
- 2 The strategy does not require investing additional cash.
- 3 The strategy does not increase the risk of your position.

Main risks of the options strategy

- 1 The share price rises significantly, and you miss out on the rise. That is, the risk of the strategy compared to a simple long stock position is the opportunity cost of forgone profits on the stock.

Characteristics of the options strategy

<i>Objective</i>	To exit your losing stock position at break-even.
<i>Construction</i>	For every 1000 shares held, buy one at-the-money call and sell two out-of-the-money calls such that the premium income received from the two sold calls covers the cost of the bought call.
<i>Market view</i>	You expect a partial recovery in the share price.
<i>Maximum profit</i>	You will break-even if the share price rises to the strike price of the sold calls.
<i>Maximum loss</i>	Zero (so long as the strategy is implemented at zero cost).
<i>Time Decay</i>	Time decay works in your favour in respect of the sold calls, but against you for the bought call.
<i>Volatility</i>	Increase in volatility works against the sold calls, but in favour of the bought call. Vice versa for decrease in volatility.
<i>Margins</i>	No, as long as the underlying stock is lodged as collateral.

Questions and Exercises

- 1 What is a 'covered call'?
- 2 What is a 'buy write'?
- 3 How can you generate extra income for your portfolio while you are holding stocks?
- 4 In what circumstances will an option expire worthless, and in what circumstances is an option likely to be exercised?
- 5 Describe the way in which the risk-return profile of the long stock position is modified by the sale of covered calls.
- 6 List three reasons why you might want to use the covered call strategy.
- 7 Give a numerical example of the acceleration of time decay as the option approaches expiry.
- 8 As a seller of options, does time decay work against you or in your favour? Does this mean that you would rather sell long-dated options or short-dated options?
- 9 When selling a call option, does a lower strike price mean a higher or lower premium?
How does this affect the cap on your upside exposure?
- 10 Which options are typically of most interest to the covered call seller, in-the-money options, at-the-money options, or out-of-the-money options? Why?
- 11 Under what circumstances will the strategy of covered call selling underperform a long stock portfolio?
- 12 What is the worst that can happen to the covered call seller if a strong upward movement in the stock causes the share price to rise above the strike price?
- 13 What is the worst that can happen to the covered call seller if there is a large downward movement in the share price?
- 14 Which options strategy could you use to provide effective protection for a stock?
- 15 In what circumstances would you consider purchasing protection for a stock?
- 16 How can options help reduce the market impact of acquiring stock?
- 17 What is the objective of the 'stock repair strategy'?
- 18 How much does it cost to implement the stock repair strategy, and how does the strategy affect the risk profile of your long stock position?

4. Strategies for Value Managers

Since the 'value style' of investing often identifies a particular share price level that is considered 'fair value', this investment style lends itself to targeting specific pre-defined entry and exit points for a particular stock. Value style managers may wish to buy a stock that is trading at a significant margin below their estimation of its fair value, or sell at a significant margin above.

In these situations, option strategies can be useful in the acquisition or divestment of stocks at target prices, or in locking in unrealised profits at particular levels.

This Chapter looks at three options strategies that are particularly useful to value managers:

- i acquiring stocks at pre-defined entry points
- ii divesting stocks at pre-defined exit points
- iii locking-in unrealised profits and reducing the volatility of a portfolio.

Acquiring Stock at Pre-Defined Entry Points

Selling out-of-the-money put options can be used as a means of acquiring physical stock at prices below current market levels.

Assume you are a value manager who, in January, is watching a promising stock, ABC Limited, which you would like to acquire for your portfolio. The current market price is \$10.00, which is \$0.80 above what you are prepared to pay. With a view to acquiring the stock at your target price of \$9.20 sometime this quarter, you sell a \$9.50 March put option; this has a strike price slightly above your target acquisition price. Premium of \$0.30 income is received.

If the share price has fallen below \$9.50 at expiry, the option will be exercised¹⁰. You will be 'put' the stock at \$9.50. Your effective purchase price is \$9.20 – which is the strike price of the option (\$9.50) less the premium received (\$0.30). You have acquired the stock at your target price of \$9.20, even though the market may not have traded that low.

Note that this example has not included transaction costs that would need to be factored into an actual case.

The sale of out-of-the-money put options can be viewed as an alternative to placing a limit order to buy stock at a target price below current market levels.

If things do not go to plan

If the share price does not fall below the strike price, the option will not be exercised. You do not acquire the stock, but you have received \$0.30 premium income that enhances the performance of the existing portfolio.

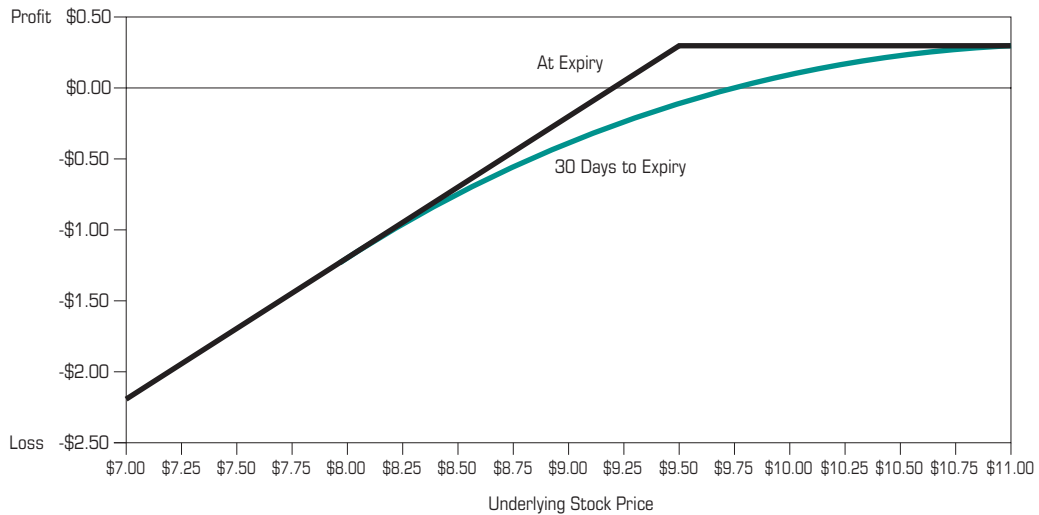
What are the risks?

The main risk is that the share price falls significantly. Selling out-of-the-money put options gives you downside equity exposure without the corresponding unlimited upside potential.

If the share price falls significantly, and you change your view and no longer wish to acquire the stock, you may need to unwind your options position at a significant loss. Otherwise, you may choose to maintain your position until expiry, when you will be obliged to buy the stock at the strike price, which by then could be well above the market price.

¹⁰ Between 12% and 15% of all open option contracts are exercised at expiry. Prior to expiry it is not common for options to be exercised because the holder would be giving up any time value that remains. The exception to this is around ex-dividend time, when the holder of an in-the-money call option may exercise early (just before the stock goes ex-dividend) in order to capture the dividend.

Acquiring Stock at Pre-defined Entry Points
Short \$9.50 Put at \$0.30
Target Acquisition Price is \$9.20



Advantages of acquiring stock via options versus a limit order

The strategy of selling put options to acquire stock can be compared to the strategy of placing a limit order to buy the physical stock at a target price below current market levels.

Due to the receipt of premium income, the option strategy has certain advantages over the limit order physical strategy. For example, since the effective entry price is the strike price less the option premium, the market does not need to trade as low in order for you to achieve your target entry price. In the example above, you bought stock at \$9.20, even though the market may not have traded below, say, \$9.40.

Another advantage is that payment for the shares is delayed until the put is exercised. In the meantime, you can be earning interest on the cash that is held for the purpose of buying the shares. This is especially relevant if you sell in-the-money puts to acquire stock. If the puts are deep enough in-the-money, you have a high degree of likelihood of acquiring the stock at a future date. In the meantime, you can be earning interest on the cash.

Furthermore, time decay works in favour of the option writer. This is an important characteristic of written options strategies: if you sell options, time is on your side. For each day that passes, time value of the option will erode. In fact, you can use an options calculator¹¹ to tell you approximately how many cents per day will be eroded as a result of time decay.

What if your view changes?

First, consider the case of the physical strategy in which you place a limit order to acquire stock at a target price below the current market level. If the share price drifts downwards towards your target price, and if your view changes such that you no longer wish to acquire the stock, you are able to cancel your order before it is filled. At no time have you assumed actual exposure to the market.

In contrast, when you sell a \$9.50 March put option with a view to acquiring stock, you are taking a position in the market, and therefore have an exposure to market movements. As time elapses, and as the market price of the underlying stock moves up or down, the value and the risk/reward characteristics of the option position change.

¹¹ see the calculators and tools on the ASX website at www.asx.com.au/options

Nevertheless, if you subsequently change your view and no longer wish to acquire the stock, you may choose to buy back the \$9.50 March put option at any time. Depending on how much time has passed (which will decrease the value of the put), and how much the underlying stock price has fallen (which will increase the value of the put), the option could be worth more or less than \$0.30 at the time that you decide to unwind your position.

Points to remember

- 1 You can write put options as a strategy to buy stock cheaply.
- 2 The strategy can result in heavy losses if the stock price falls significantly prior to expiry.
- 3 Be alert to the possibility of early exercise.
- 4 Always monitor your position closely.

Main benefits of the options strategy

- 1 Generates premium income.
- 2 If the option is exercised, purchase of the shares is achieved at a lower price than the share price at the time of writing the option.
- 3 Time decay works in favour of the sold option position.
- 4 Payment for the shares is delayed until the put is exercised, which means that interest can be earned on the cash.

Main risks of the options strategy

- 1 You have downside equity exposure without the corresponding unlimited upside potential. If the share price falls significantly, and you change your view and no longer wish to acquire the stock, you may need to unwind your options position at a significant loss.
- 2 At expiry, the share price may have fallen significantly. In this case you will be obliged to buy the shares at the strike price of the put, which at the time of exercise could be well above the market price of the shares.
- 3 The share price could rise significantly, and you miss out on buying the stock and thus benefiting from the rise. This is not an actual cost to you, but can be seen as an opportunity cost.

Characteristics of the options strategy

Objective To acquire stock at a pre-defined target price (strike price minus premium), and to earn income from the sale of the put options in the event that your acquisition is unsuccessful.

Construction Sell a put option such that the strike price minus the premium is equal to your target entry price.

Market view Neutral to mildly bullish in the short-term, and more bullish in the longterm. You want to acquire the stock for your portfolio, so you must have a positive long-term view on the stock. However, little price appreciation is expected in the short-term.

Maximum profit Maximum profit at expiry is the option premium (but if your strategy has been fully successful you will have acquired the shares at your target price).

Maximum loss Maximum loss at expiry occurs if the share price falls to zero. In this case, you lose an amount equal to the strike price less the premium received.

Time Decay Time decay works in favour of the sold put position.

Volatility Increase in volatility works against the sold put position.

Margins Yes. For information on margins contact your broker or consult the ASX website: www.asx.com.au/options

Divesting Stock at Pre-Defined Exit Points

Writing calls while holding a long position in the underlying stock is a common strategy.

This has been discussed in detail in Chapter 3 in the context of enhancing the yield on your portfolio. Here we employ the same mechanism but with a different objective: divestment of your current stock holding at your target price.

Example

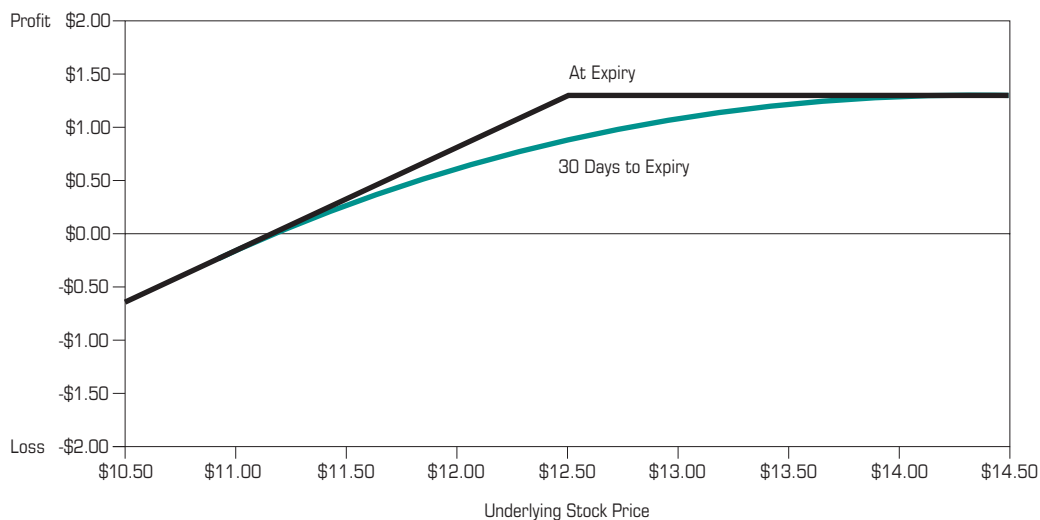
Assume that you are a value manager who has a long position in XYZ stock, and would like to divest at your target price of \$12.80. The market is currently at \$11.50.

One strategy available to you is to sell out-of-the-money call options with a strike price slightly below your target exit price, say \$12.50. In this case, premium income of, say, \$0.36 is received from the sale of the call options. If the share price rises above \$12.50 and the option is exercised, the effective exit price of the stock is \$12.86, which is calculated as the strike price of the option plus the premium received. You have thus realised your target price. Note that for simplicity, transaction costs have not been included in this example.

Divesting Stock at Pre-defined Exit Points

Long Stock at \$11.50 + Short \$12.50 Call at \$0.36

Target Exit Price is \$12.80



If things do not go to plan

If the share price does not rise to \$12.50 during the life of the option, the option will not be exercised. In this case, you do not exit the stock at your target price, but you still receive premium income of \$0.36 that enhances the performance of your portfolio. You can continue to hold the stock with a view to divestment if the market reaches your target price at a later date.

Alternatively, you can initiate the same 'covered call' strategy at regular intervals until the calls are exercised and you receive your target price. If the share price never reaches the strike price and the calls are never exercised, at least you have been generating premium income along the way. Your stock is working harder for you.

While you continue to write covered calls, and while the options are not exercised, you will outperform other managers who have the same position in the underlying stock, but who do not use this options strategy.

What are the risks?

One risk of this strategy is the opportunity cost of forgoing the upside if the market rallies hard and the stock price rises beyond expectations, that is, beyond \$12.86 in this example. In this case, the call option will be exercised, and you will be obliged to sell the stock at \$12.50. Even though you have received \$0.36 in premium income, resulting in an effective sale price of \$12.86, the market price of the stock may have risen much higher.

This opportunity cost is not relevant if you would have stuck to your original plan and sold at \$12.80 anyway. If you were always going to sell at your target price in any case, the premium income received along the way ensures outperformance relative to a 'no options' strategy.

Since selling covered calls caps your upside, the strategy should be employed only when your market view is neutral to slightly bullish (not very bullish), and when your target exit point is genuinely pre-determined. You need to be content to exit the stock at your predetermined target price, and not concerned by the prospect of being exercised.

The main risk of the position, however, relates to the downside, where an unexpected drop in the share price can result in large losses. Your long stock position has this risk regardless of whether the options strategy is implemented or not. Where call options are sold, the premiums received provide a cushioning effect in the face of a large drop in the share price. In the event of a fall in the share price, you will always be better off having written calls than simply having held the shares alone.

Relative performance to the 'no options' strategy

This options strategy modifies the risk/return characteristics of the long stock only trade by lessening the amount of profit/loss resulting from extreme moves upwards or downwards in the stock price, and increasing the profits available in the event that the stock price remains relatively flat over the life of the option. The sale of the call option caps the potential upside, but also generates premium income that provides a limited buffer against a fall in the price of the underlying share.

Advantages of divesting stock via options instead of a limit order

The sale of out-of-the-money call options over XYZ can be viewed as an alternative to placing a limit order to sell the physical stock at a target price above current market levels.

Due to the receipt of premium income, this option strategy has advantages over the limit order physical strategy. For example, since the effective exit price is the strike price plus the option premium, the market does not need to trade as high in order for you to achieve your target exit price. In the example above, you can realise an effective exit price of \$12.86 if the underlying share price trades above \$12.50.

Another advantage is that time decay works in favour of the option writer. As time passes, the value of the option erodes. This means that in the absence of a sustained upwards movement in the share price, the sold calls will expire worthless, and the option writer is able to capture the premium without suffering any opportunity cost.

What if your view changes?

Since the calls you have written are covered by your stock holding, you are not exposed to physical risk on the upside. That is, the worst that can happen on the upside is that your stock is called away at \$12.50 leaving you with a profit of \$0.36 premium plus capital appreciation on the stock up to the option's exercise price. There is, however, the opportunity cost of missing out on capital appreciation above the strike price. If your stock view changes for the positive, and you are suddenly keen to retain your stock, you can buy back the calls at any time on market, although this may result in a loss on the options part of the trade.

Points to remember

- 1 You can write call options as a strategy to sell stock at prices above current market levels.
- 2 The strategy can result in opportunity costs if the share price rises above the strike price plus the option premium.
- 3 Be alert to the possibility of early exercise.
- 4 Always monitor your position closely.

Main benefits of the options strategy

- 1 If the option is exercised, sale of the shares is achieved at a higher price than the share price at the time of writing the option.
- 2 Generates premium income in flat and falling markets.
- 3 Provides limited cushioning in the case of a market fall.
- 4 Time decay works in favour of the sold option position.

Main risks of the options strategy

- 1 Share price falls significantly, and the call option premium provides only limited protection. In the event of a fall in the share price, however, you will always be better off having written a call option than simply having held the shares alone.
- 2 Share price rises significantly, and you miss out on the rise. This is not an actual cost to you, but can be seen as an opportunity cost.

Characteristics of the options strategy

<i>Objective</i>	To exit the stock at a pre-defined target price (strike price plus premium), and to earn income from the sale of the call options in the event that your divestment is unsuccessful.
<i>Construction</i>	Write out-of-the-money calls over your existing stock holding such that the strike price plus the premium is equal to your target exit price.
<i>Market view</i>	Neutral. Since you are employing this strategy in order to divest your stock holding you do not have a positive long-term view on the stock. However, you are not so bearish that you want to sell immediately at current market levels.
<i>Maximum profit</i>	At expiry, the maximum profit on your overall position (stock plus options) accrued during the life of the options strategy is the strike price plus premium less the market price of the stock at the time of writing the option.

Maximum profit will occur when your strategy has been fully successful and you have divested your shares at your target price.

Maximum loss At expiry, the maximum loss on your overall position (stock and options) accrued during the life of the options strategy will occur if the stock price falls to zero. In this case you will lose the market price of the stock at the time of writing the option less the premium received.

Time Decay Time decay works in favour of the sold call position.

Volatility Increase in volatility works against the sold call position.

Margins No, as long as the underlying stock is lodged as collateral.

Locking in Unrealised Profits and Reducing the Volatility of a Portfolio

Options can be used to lock in unrealised profits and reduce the volatility of your stock holding, and thereby also reduce the volatility of your portfolio as a whole.

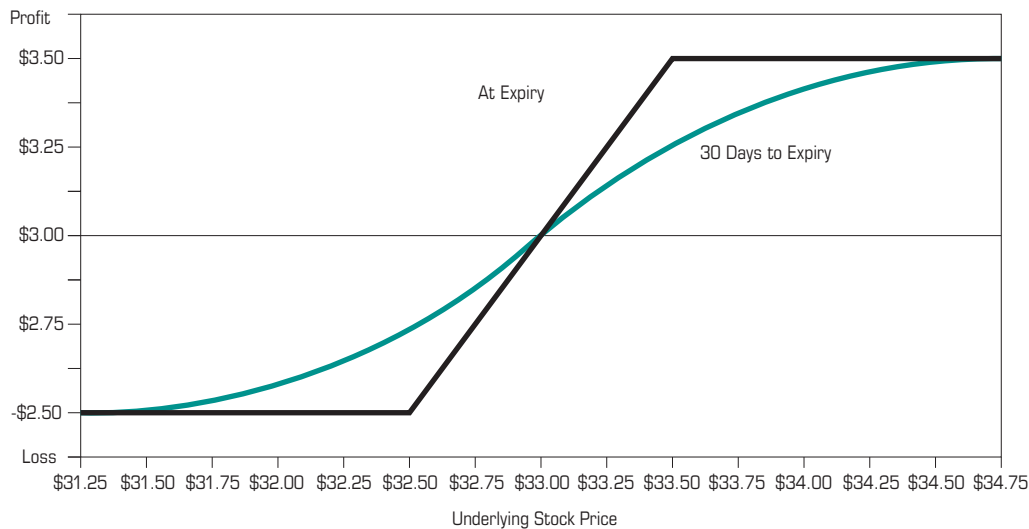
One of the most popular ways to do this is to use an options strategy called a 'collar', which is basically a cap plus a floor on your existing long stock holding. It is used primarily to lock in unrealised profits, but also results in a reduction in volatility of your portfolio.

Conceptually, when you implement a collar, you are selling the stock's upside potential by writing a call, while simultaneously purchasing downside protection by buying a put. The premium received from the sold call can pay for the bought put, making the strategy revenue neutral.

This strategy has the advantage that price risk (variation in returns) is confined to the region between the two strike prices. Risk is eliminated below the put strike, 'a floor', and above the call strike, 'a cap'. By introducing a cap and a floor to your long stock position, the risk of your stock holding is reduced. You are no longer subject to extreme outcomes on this stock. This means that the volatility of your overall portfolio also has been reduced.

Collar with Stock

Long Stock at \$30.00 + Long \$32.50 Put at \$0.80 + Short \$33.50 Call at \$0.80



Typically, in order to implement the strategy, an out-of-the-money call is sold, and an out-of-the-money put is purchased, thereby placing a band, or collar, around the stock at the current market price. The strategy constrains both the potential risk and the potential reward of the underlying stock position.

Example of locking-in profits

Assume that you hold stock PQR at an entry price of \$30.00. The market price is currently \$33.00. You want to preserve your gains, and reduce the risk of the stock holding, so a collar is ideal. In order to implement the strategy, you buy a put option with a lower strike price than the current market price, say a \$32.50 strike. The put option costs you \$0.80 to buy, and is your floor because it insures your stock at this level. At the same time, you sell a call option with a strike price higher than the current market level, say \$33.50, and with the same expiry date, and receive a premium of \$0.80. This is your cap because you can no longer profit from a rise in the share price above this level.

By implementing this collar, the specific risk associated with your holding of PQR is reduced, and you are exposed to stock price fluctuations only within the range of \$32.50 to \$33.50. Consequently, the volatility of your overall portfolio is reduced for the duration of the options' life.

In this example, the collar around PQR has been implemented at zero net cost. However, because of 'skew'¹², the cost of puts will

normally not be exactly symmetrical to the cost of calls. For simplicity, skew has been ignored in this example.

Extent of volatility reduction

The actual levels of the cap and floor can be tailored to your stock view by carefully selecting the most appropriate strike prices for the put and the call. This will, in turn, also define the extent of the volatility reduction in the overall portfolio.

The advantage of the collar over the protective put alone is a reduction in costs, since the premium received from the sold call subsidises the cost of the bought put. The trade-off is the relinquishing of upside exposure.

Other things being equal, a higher strike for the sold call will result in a lower premium, and a lower cross subsidy for the bought put. However, the advantage of this is that additional upside exposure is retained. The collar strategy can have varying degrees of bullishness depending on which call strike is sold. The further out-of-the-money the call strike, the more bullish is the position.

The level of the strike price of the bought put can also be varied to meet your needs for downside protection or your view on possible share price movements. In this way, the degree of volatility reduction of the portfolio can be tailored to suit your requirements.

¹² Options of different types (whether puts or calls) or with different strike prices or expiry dates tend to trade at different implied volatilities. This is known as 'skew'.

Points to remember

- 1 If you use a collar to lock in unrealised profits, you will forfeit any potential upside above the strike of the sold call.
- 2 You will be protected against a fall in the share price below the strike of the bought put.
- 3 The volatility of your portfolio will be reduced.

Main benefits of the options strategy

- 1 Locks-in unrealised gains in a stock by providing downside protection.
- 2 Reduces the volatility of the stock and of the overall portfolio.
- 3 Very low costs of implementation.

Main risks of the options strategy

- 1 Opportunity cost if the stock price moves above strike price of the sold call.

Characteristics of the options strategy

<i>Objective</i>	To protect the capital value of your stock holding while retaining a modest amount of upside potential, and to reduce the volatility of your stock holding and of your overall portfolio.
<i>Construction</i>	Buy out-of-the-money puts and sell out-of-the-money calls over your existing stock holding (usually so that premium paid is equal to premium received with the result that the collar is implemented at zero net cost).
<i>Market view</i>	Broadly neutral, but possibly with concerns of a downwards move.
<i>Maximum profit</i>	Sold call premium less bought put premium, plus stock profits up to (but not above) the strike price of the sold call.
<i>Maximum loss</i>	Bought put premium less sold call premium, plus stock losses down to (but not below) the strike price of the bought put.
<i>Time Decay</i>	Neutral. Time decay hurts the bought put, but helps the sold call.

Volatility

Neutral. An increase in volatility helps the bought put, but hurts the sold call.

Margins

No, since sold options are covered by long stock which is usually lodged as collateral.

Questions and Exercises

- 1 Physical stock can be acquired at target prices that are below current market levels by doing which of the following:
 - a) selling in-the-money puts
 - b) buying in-the-money puts
 - c) selling out-of-the-money puts
 - d) buying out-of-the-money puts.
- 2 What is the main advantage of acquiring stock via options instead of via a limit order?
- 3 What is the main risk of acquiring stock via options instead of via a limit order?
- 4 Physical stock can be sold at a target price above current market levels by doing which of the following:
 - a) selling in-the-money calls
 - b) buying in-the-money calls
 - c) selling out-of-the-money calls
 - d) buying out-of-the-money calls.
- 5 What is the main advantage of divesting stock via options instead of via a limit order?
- 6 What is the main risk of divesting stock via options instead of via a limit order?
- 7 Locking-in unrealised profits and reducing the volatility of a portfolio with a collar can be implemented by doing which of the following:
 - a) buying in-the-money puts and selling in-the-money calls
 - b) buying out-of-the-money puts and selling out-of-the-money calls
 - c) buying out-of-the-money puts and selling in-the-money calls
 - d) buying in-the-money puts and selling out-of-the-money calls.
- 8 What is the advantage of the collar over the protective put alone?
- 9 What is the main risk of the collar strategy?

5. Top Ten Tips from Brokers

1 Sell covered calls over stocks that have a 'hold' rating

The covered call strategy has a natural synergy with a typical fund manager's requirement to permanently hold a long equity position. If you have a view that a certain stock is a 'hold', then it makes sense to earn extra income on the holding. You do this by writing calls over a portion of the holding, thus collecting premium income.

2 Hold stocks with good yields and sell straddles/strangles

The short straddle/strangle strategy works especially well with stocks that have good yields because there is a 'built-in automatic stabiliser'. When the stock price rises, the yield falls in percentage terms, and so there is downwards pressure on the stock. When the stock price falls, the yield rises in percentage terms, and so there is upwards pressure on the stock.

3 Always document your initial strategy

Options can sometimes be mistakenly blamed for underperformance when in fact it is the initial stock view that is to blame. For example, assume your portfolio holds a stock with a sell target of \$10.00. Based on this market view you decide to sell \$10.00 call options for \$0.40. If the stock rallies past \$10.00 to \$11.00 and if you held the option to expiry, you would be underperforming \$0.60 per share (in terms of opportunity cost). Without documenting the original view, it might be incorrectly considered that the options transaction had contributed to the underperformance.

4 Calls could offer cheaper exposure than stock

When you need to buy a stock there will be many occasions when, as part of the price discovery process, you should also look at prices in the options market. For example, if you believe that the share price has possible downside potential in the short term, you can at the options market to see if cheap calls are available. This is a way to participate in the upside while protecting against downside risk at the same time. This may be particularly relevant when you are seeking exposure to a stock solely because of its significance in the index, and so need to be in a position to gain from upside movement in the stock.

5 Buy more time, sell less time

When considering which option expiry date to choose, remember that time decay accelerates towards expiry. Therefore:

- when buying you should favour longer dated options
- when selling you should favour shorter dated options.

6 Always know your exit plan prior to executing your options strategy

A well thought-out contingency plan can be a 'get-out-of-jail-free card' to be played if your position turns sour. For example, writers of call options who want to avoid assignment can often remove the threat by 'rolling up and out'. That is, if the price of the underlying rises strongly, and if you want to continue to hold onto the stock, you can buy back your sold calls (albeit at a loss) on market and then sell calls at a higher strike price and/or in more distant months. This will raise additional premium income to offset your loss, maintain your covered call position, and continue to lock in a sale price at a higher price level and a more distant date.

7 Be aware of early exercise risk

Standard equity options can be exercised at any time. If a call option is exercised prior to expiry, it will usually be on the day before the underlying stock goes ex-dividend. The intention is to 'capture' the dividend. Early exercise is likely in the following situations:

Calls: Dividend > corresponding put price + interest expense of buying stock earlier than the expiry date. For in-the-money calls, the industry standard is that if the value of the dividend is more than the value of the corresponding put plus interest, then the call should be exercised for the dividend.

Puts: Interest expense of holding the shares until expiry > corresponding call price.

For in-the money-puts, the industry standard used is that if the value of the corresponding call option is less than the cost of carrying the underlying stock to expiry, then the put should be exercised. The importance of this relationship is due to the fact that stock ownership plus a long put is an equivalent position to holding a call option with the same strike price and expiry. The two strategies are said to be synthetically equivalent.

Writers of call and put options who want to avoid assignment (being exercised against) may need to either buy back or roll that short option position to another strike and/or expiry, being mindful that the option they roll to also may be a candidate for early exercise.

8 Being paid to reduce your benchmark risk

Fund managers with an underweight tilt in a particular stock can sell puts to neutralise some of the benchmark risk. If the stock price rises, you collect the premium income 'for free' which reduces your underperformance of benchmark. If the stock price falls, your underweight position in the stock generates relative outperformance, but the sold puts, if exercised, again reduce the divergence from benchmark. Conversely, the benchmark risk associated with an overweight tilt to a stock can be reduced by selling calls over that stock holding. Income is raised. Effectively, upside risk is monetised, and downside risk is cushioned. Tracking error is reduced.

9 Always consider possible changes in volatility of the underlying stock

The most important factor in determining the price of an option is the volatility of the underlying stock. When you buy or sell an option based on a directional view of the underlying share price, you cannot afford to ignore possible changes in the level of volatility.

- if you are right about direction, but wrong about volatility – you might not make money
- if you are wrong about direction, but right about volatility – you might not lose money.

10 Understand the tax situation

The taxation rules applying to options are relatively straightforward but not widely understood. Make sure you understand the tax implications of options positions.

6. Strategies for Growth Managers

Growth stocks usually have higher P/E ratios and trade at higher valuations than other stocks, which means that if a growth company suffers a setback or fails to meet market expectations, the stock has the potential to fall sharply. Since growth stocks tend to be volatile and have the capacity to depreciate rapidly and unexpectedly, growth style managers can benefit from a degree of downside protection.

This Chapter looks at two options strategies that are useful to growth managers:

- i substituting call options for stock
- ii obtaining exposure to a stock at low cost.

Substituting Call Options for Stock

The objective of this strategy is to obtain exposure to an upward move in a share price, while simultaneously ensuring that your capital is protected. This strategy is not intended to leverage your portfolio. The intention is merely to substitute call options for a long stock position. The portfolio buys call options and receives dollar-for-dollar participation in a stock rally with reduced downside risk.

This strategy is appropriate if you are bullish on a stock but risk averse. It modifies the riskreturn profile of a simple long stock position to enable you to obtain equity exposure to a stock's potential upside without exposing you to the full extent of the stock's potential downside and thus putting the portfolio's assets at risk.

Sometimes called the '90/10 strategy', the strategy involves purchasing call options with

around 10% of the funds available for allocation to a stock, and purchasing cash-equivalent interest-bearing securities with the remaining 90%. The 10% allocation used to purchase call options has sufficient leverage to allow the portfolio to participate dollar-for-dollar in a share price rally. In a low-volatility environment, the strategy is perhaps more accurately described as '95/5'.

Income is received from the investment in interest-bearing securities, and this portion of the portfolio remains relatively risk-free. The maximum risk of the overall position is the premium paid for the calls minus the interest income received.

This type of strategy is extremely useful for the efficient management of cash within a portfolio. The use of options¹³ allows you to stay fully invested on an effective basis while retaining uncommitted cash to deal with other events such as tax and fee payments and unreceipted dividends.

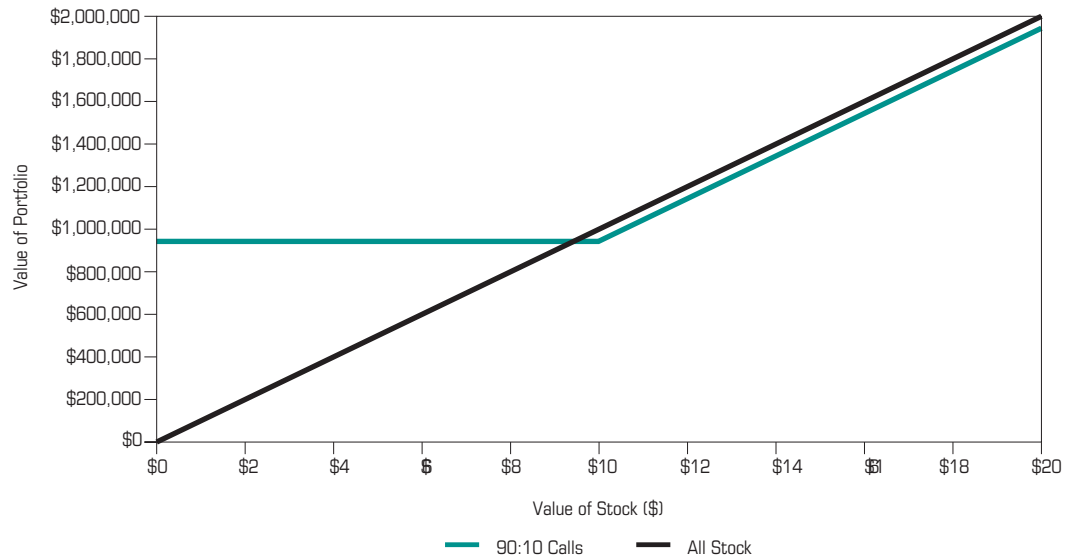
Example

Assume your analyst has recommended the purchase of DEF Limited, and you have \$1 million earmarked for the purchase of the stock, which is currently trading at \$10.00. We will compare two alternatives:

- i invest the entire \$1 million in DEF stock
- ii invest \$900,000 in bank bills at the rate of 5% p.a., and invest the other \$100,000 in at-the-money DEF call options with an expiry date 12 months out.

¹³ LEPOs (Low Exercise Price Options), which allow investors to profit from movements in the underlying security on a one-for-one basis, can also fulfil the same function. LEPOs can be over either shares or an index, and there are currently around 50 stocks with LEPOs listed. Buying a LEPO is similar to a forward purchase of shares, while selling a LEPO is similar to a forward sale of shares. Because of their very low exercise price, LEPOs trade for much larger premiums. For more information on LEPOs see www.asx.com.au

90/10 Strategy



Referring to the pay-off diagram above, we can see that at the expiry date of the options, the worst-case outcome for the options strategy is \$945,000¹⁴. That is, using the options strategy, your portfolio will still be worth \$945,000 in twelve months time even if DEF stock is trading well below \$10.00 and the call options expire worthless.

In comparison, under the same scenario the value of the 'all stock' portfolio could be worth considerably less. The all stock portfolio is subject to large losses in the event that the share price falls significantly. In fact, the options strategy will have outperformed the all stock portfolio if, in twelve months' time, DEF is trading below \$9.45.

On the other hand, consider the situation in twelve months time if the share price of DEF has risen. If DEF is above \$10.00, the calls are exercised and you take delivery of the underlying stock. The options strategy has retained exposure to the stock's upside and has participated in a share price rally on a dollar-for-dollar basis. In this case, profits on the option portfolio will be less than the all stock portfolio by an amount equal to the net difference between the cost of the calls and the interest income received (ie. \$55,000 in the above example).

That is, the portfolio pays away the call option premium, and in return receives dollar-for-dollar participation in an upward rally, interest on the remaining cash component, and downside protection for the portfolio's assets.

The other point of difference between the all stock portfolio and the 90/10 strategy concerns dividends. If your exposure to the stock is through options, you are not entitled to any dividends payable. Dividend income is an important consideration when comparing the two strategies.

For simplicity, we have used the round number of 10% for the cost of the calls.

Depending on which stock you choose (and, in particular, its volatility), you may be able to obtain the calls at significantly less cost. For example, at the time of writing, twelve-month at-the-money calls on Australian bank stocks could be obtained for around 10% of the value of the underlying shares. Since this figure is only slightly above the prevailing rate of interest, it is possible to establish an extremely cost effective position.

Also for simplicity, transactions costs have not been factored into this example.

¹⁴ \$945,000 represents the original \$900,000 investment in bills plus twelve months' interest at 5% p.a.

Risks

The maximum loss of the options strategy (the premium of the call options minus interest income received plus the dividend income foregone) is also the approximate amount by which the options replicated portfolio will underperform the all stock portfolio in the event of a share price rally. In effect, the 90/10 strategy provides most of the upside reward while truncating the downside risk at an acceptable level.

Managing the position

Once entered into, the options position does not have to be held for the entire period. If your view of the market changes at any time before expiry, you can always exit your position by selling the options. In the event that the share price falls, by exiting the options position before expiry you can avoid losing your entire premium.

If the share price has risen by the time of expiry, you will need to decide whether you want to maintain your exposure to the share, and if so, whether to continue to use options, or to buy the stock. If you want to maintain your exposure, you can either exercise your options and receive stock, or you can roll out your options to a more distant month.

The 'switch' variant

The same basic idea can be used to lock in existing profits on a share position. If you have a long position in a share that is showing profits, you can 'switch' out of the shares into call options. You sell your shares and use a small percentage of the proceeds to buy options while investing the remainder in cash-equivalents.

This strategy locks in profits by providing downside protection, while at the same time allowing participation in further price appreciation. The strategy may be appropriate when you are concerned about a fall in the price of the shares you hold, but do not want to eliminate your exposure to the stock in case the price rises.

A switch of this nature will reduce the volatility of your position in this share, and also of your overall equity portfolio. The reason that this occurs can be seen from the payoff diagram above. On the upside, the options position will always show slightly less profit than the all stock portfolio; and on the downside the

options position will always show considerably less loss than the all stock portfolio. Therefore, the options portfolio has a lower degree of variation in returns.

Points to remember

- 1 This strategy, which essentially substitutes options for the underlying stock, will be especially beneficial during times when options volatilities are low (options premiums are cheap).
- 2 If you own a replicated options portfolio instead of the underlying stocks, you do not receive any dividend payments.

Main benefits of the options strategy

- 1 Maintains exposure to a rise in the share price.
- 2 Limits losses in the event of a fall in the share price.

Main risks of the options strategy

- 1 The maximum risk of the options strategy is the premium paid for the calls, less the interest income received plus the dividend income foregone.
- 2 Profits in the event of a share price rise will be lower than if you hold the shares directly.

Characteristics of the options strategy

<i>Objective</i>	To obtain exposure to an upwards move in a share price, while simultaneously ensuring that your capital is protected.
<i>Construction</i>	Buy call options with a small percentage of the funds available for allocation to a stock, and buy interest-bearing securities with the remainder.
<i>Market view</i>	Bullish on the stock, but risk averse.
<i>Maximum profit</i>	Unlimited.
<i>Maximum loss</i>	The maximum loss of the options strategy is the premium of the call options less the interest income received plus the dividend income foregone.

<i>Time Decay</i>	Time decay works against the bought calls.
<i>Volatility</i>	An increase in volatility works in favour of the bought calls.
<i>Margins</i>	No.

The strategy, referred to as a 'bull call spread', consists of buying a call option with a lower strike price and selling a call option with a higher strike price. Usually, the position is implemented with the strike of the bought call around the same level as the current share price (ie. at-the-money). The ideal result at expiry is for the stock price to be at or above the strike price of the sold call.

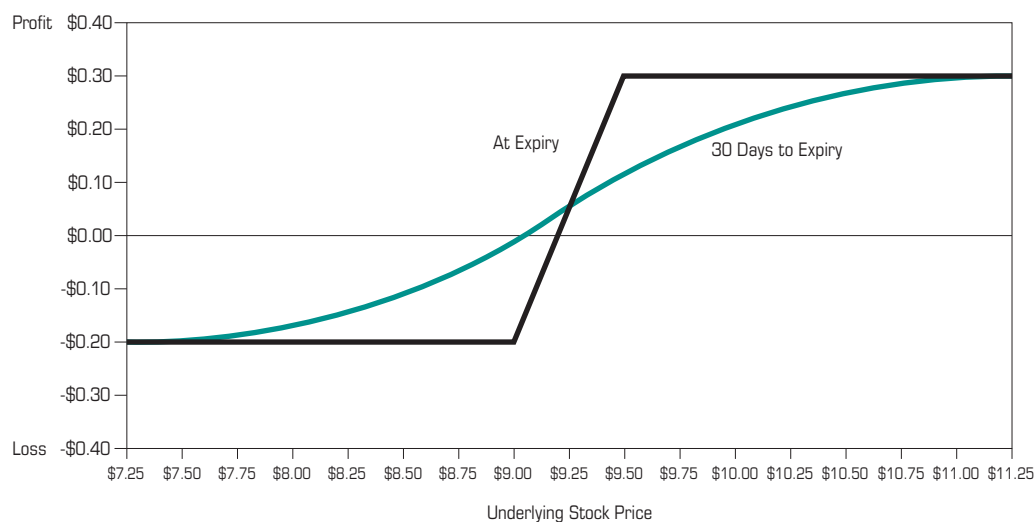
Obtaining Exposure to a Stock at Low Cost

This strategy can be used when you are moderately optimistic about the prospects for a stock, but not bullish enough to buy a call option outright. It is not the intention of this strategy to leverage your portfolio. This is a low cost method of obtaining exposure to an expected modest upwards move in a stock.

The premium income received from the sale of the higher strike call makes the spread a cheaper strategy than the simple purchase of an at-the-money call, but it also limits the profits that can be made. Any price appreciation beyond the strike price of the sold call will not increase your profits.

Bull Call Spread

Long \$9.00 Call at \$0.28 + Short \$9.50 Call at \$0.08



Therefore, the call spread is generally suited to a moderately bullish view. If you have an extremely bullish view, you would be better off making the outright purchase of a call.

Example

In mid April, GHI stock is trading at \$9.00. Your analyst thinks the stock will make a modest gain (around 5%) over the next two months but is unlikely to do better than that. You consider purchasing the stock, but would prefer a low cost method of obtaining upside exposure, so you implement the following position:

Buy 1 GHI June \$9.00 call @ \$0.28
 Sell 1 GHI June \$9.50 call @ \$0.08

Cost of Spread \$0.20

One month later, in mid May, the share price has risen to \$9.50, and the spread has increased in value from \$0.20 to \$0.38. At this point, you could choose to unwind the spread early for a profit of \$0.18 by doing the following:

Sell 1 GHI June \$9.00 call @ \$0.58
 Buy 1 GHI June \$9.50 call @ \$0.20

Value of Spread \$0.38

Alternatively, you could decide to hold on to the spread and, if at expiry GHI is still trading at or above \$9.50, maximum profit of \$0.30 will have been achieved. Maximum profit with this strategy is the difference between the

strike prices less the cost of the spread. For simplicity, transaction costs have not been included in this example, but should be considered in the analysis of a real situation.

Points to remember

- 1 Consider the bull call spread when you are expecting a limited rise in the price of the stock.
- 2 Be sure that the cost of the spread is justified by the potential reward.
- 3 If the share price rises sharply, it may be advisable to exit the strategy once the upper strike price is reached.
- 4 Although time decay is helpful around the strike price of the short leg, unwinding the strategy early removes the risk of exercise on the short call.
- 5 If the stock price falls suddenly, the spread may be unwound before the bought call loses too much time value.

Main benefits of the options strategy

- 1 Provides exposure to a rise in the share price without the full costs of long stock.
- 2 Lower cost strategy than outright purchase of call option.

Main risks of the options strategy

- 1 If the share price at expiry is below the lower strike price, both options will expire worthless and the cost of the spread will be lost.
- 2 Factor in transaction costs – brokerage is payable on both legs of the strategy on entry, and again on unwinding the strategy.

Characteristics of the options strategy

<i>Objective</i>	To obtain low cost exposure to an expected modest upwards move in a share price.
<i>Construction</i>	Buy a call option with a lower strike price and sell a call option with a higher strike price. Usually, the strike of the bought call is around the money. The strike price of the sold call depends on your stock view.
<i>Market view</i>	Moderately bullish.

Maximum profit Difference between strike prices less cost of spread.

Maximum loss Cost of spread.

Time Decay Hurts when share price is around lower strike (bought call);
Helps when share price is around higher strike (sold call).

Volatility An increase in volatility helps the bought call and hurts the sold call.

Margins No.

Questions and Exercises

- 1 What is the objective of the 90/10 strategy?
- 2 When is the 90/10 strategy appropriate?
- 3 What are the two main benefits of the 90/10 strategy?
- 4 What is the maximum loss of the 90/10 strategy?
- 5 What is the maximum profit of the 90/10 strategy?
- 6 What is the objective of the bull call spread?
- 7 When is the bull call spread appropriate?
- 8 In order to implement the bull call spread, you do which of the following?:
 - a) buy a call option with a lower strike price and sell a call option with a higher strike price
 - b) buy a call option with a higher strike price and sell a call option with a lower strike price
 - c) buy a put option with a lower strike price and sell a call option with a higher strike price
 - d) buy a call option with a lower strike price and sell a put option with a higher strike price.
- 9 What is the maximum loss of the bull call spread strategy?
- 10 What is the maximum profit of the bull call spread strategy?

7. Strategies for Enhanced Index Managers

Enhanced index equity management seeks to add a modest excess return relative to a passive index, such as the S&P/ASX 200, while maintaining a low tracking error relative to that benchmark index. The aim is to systematically outperform the index with a stream of small excess returns with low aggregate tracking error.

Most enhanced indexed managers have tight risk controls that limit the deviations from their benchmarks. This reduces the risk that performance will diverge substantially from the index. There are a number of different approaches to enhanced index equity management using different assets and levels of risk control.

As an enhanced index manager, you will usually invest only in index stocks. You may hold all the stocks in the index, or you may prefer to omit some of the smaller stocks. In either case, you can use equity options to add value to your portfolio. We will consider two options strategies used to obtain modest outperformance of the index:

- i tilting the portfolio away from the index
- ii generating income for the portfolio.

Tilting Portfolio away from the Index

Assume that your initial portfolio is an index portfolio of long stocks. By implementing a directional tilt you will be choosing to go overweight in your favoured stocks, underweight in your unfavoured stocks, and remain equal weight in stocks that you think are fairly priced (or have no view on).

You could implement a tilt simply by creating overweights and underweights in your physical stock holdings. A limitation of this approach, however, is that you can only underweight a stock by a maximum of its weight in the index. For example, if a stock – identified as a strong sell – has an index weight of 0.2 per cent, the biggest active underweight position you can take is 0.2 per cent. This reduces your ability to add value in stocks that have been correctly identified as overvalued.

This problem can be avoided by using options to sell calls and/or buy puts on the unfavoured stock. You may choose to do either or both¹⁵. Using options, you can effectively short a stock that is considered a strong sell. This allows you to add more value to your portfolio if your view proves correct.

Similarly, effective exposure to favoured stocks can be increased by buying calls and/or selling puts. Again, you may choose to do either or both. Using options to implement portfolio tilts has the advantage that it can be treated as an overlay to an underlying physical portfolio that continues to mimic the benchmark index.

Furthermore, in cases where enhanced index funds do not perfectly mimic the benchmark index, there is a propensity to concentrate overweight or underweight positions in those stocks with larger market capitalisation and higher levels of liquidity. That is, enhanced index funds tend to focus their tilts in the larger, more liquid stocks. These are exactly the stocks that have options traded on the ASX Options Market.

Example

You are managing an enhanced index equity portfolio of \$100 million. Currently your portfolio is in line with the benchmark, the S&P/ASX 200, but you are looking to enhance your returns by tilting away from index.

It is February, and you have completed your analysis and forecasts for the coming quarter, and have formed a positive view on AAA stock, currently trading at \$8.00, and a negative view on ZZZ stock, currently trading at \$5.00. AAA is a large company that represents 4% of the index and of your portfolio. ZZZ is a smaller company that represents 1% of the index and of your portfolio.

You decide to reduce your effective exposure to ZZZ by selling calls over half your holding in the stock. Since ZZZ comprises 1% of your portfolio, you have \$1 million worth of stock in the company (200,000 shares). You decide to sell 100 at-the-money June call options at \$0.45 and receive \$45,000 in premium.

¹⁵ The combined effect of simultaneously selling calls and buying puts over unfavoured stocks is to generate a synthetic short position in this stock. This is explained by 'put call parity' which holds that a position comprising long underlying shares together with short call and long put nets to zero. That is $+U - C + P = 0$. This equation can be manipulated algebraically so that $-C + P = -U$.

You decide to increase your effective exposure to AAA by using the premium income received to buy calls. June at-the-money calls are trading at \$0.75, so you buy 60 for a cost of \$45,000.

Sell 100 ZZZ June 5.00 Calls @ \$0.45

Buy 60 AAA June 8.00 Calls @ \$0.75

Net cost of buying and selling calls is zero

If your stock views are correct, the sold calls will expire worthless, or at least diminish in value, whereas the bought calls will increase in value leaving you with a profit that enhances the return on your portfolio. If the strategy works out as planned, you may choose to sell the bought calls at a profit, or to exercise some of the options to receive the stock in order to assist with rebalancing. The sold calls can be allowed to expire, or perhaps bought back at a lower level. In either case, this position will have to be closely monitored and carefully managed.

Points to remember

- 1 Consider the strategy when you want to tilt your portfolio away from index.
- 2 On favoured stocks, buy calls (and/or sell puts).
- 3 On unfavoured stocks, sell calls (and/or buy puts).
- 4 For a revenue neutral implementation if desired, use the premium income received on the sold options to cover the cost of the bought options.
- 5 Consider exercising some of the options to assist with rebalancing.
- 6 You will need to actively manage the position.

Main benefits of the options strategy

- 1 The strategy allows you to tilt your portfolio away from index.
- 2 You can add more value in overvalued stocks than would have been possible by simply reducing their weight to zero. That is, you can effectively short a stock to increase the added value from your stock view.

- 3 Another advantage of using an options strategy to implement portfolio tilts is that it can be treated as an overlay to an underlying physical portfolio that continues to mimic the benchmark index.

Main risks of the options strategy

- 1 If your stock views prove to be incorrect, your portfolio tilts could result in underperformance of the benchmark index.
- 2 The options positions need to be closely monitored and managed on a daily basis.

Characteristics of the options strategy

<i>Objective</i>	To tilt your portfolio away from index.
<i>Construction</i>	Buy calls on favoured stocks and sell calls on unfavoured stocks.
<i>Market view</i>	Favoured stocks will outperform unfavoured stocks.
<i>Maximum profit</i>	Unlimited: bought calls could show unlimited profit.
<i>Maximum loss</i>	Price paid for options less premium received. If your market view proves incorrect, the worst that can happen is that your bought calls expire worthless, and your sold calls are exercised thus "calling away" your stock. In this case, you will suffer an opportunity cost of missing out on stock profits above your sold call strike. This will result in underperformance of benchmark.
<i>Time Decay</i>	Overall neutral: time decay works in your favour in respect of the sold calls, but against you for the bought calls.
<i>Volatility</i>	Overall neutral: increase in volatility works against the sold calls, but in favour of the bought calls.

Margins

If all of the sold calls are covered by your long stock you will not need to pay margins. In this case, the underlying stock must be lodged as collateral. If you sell calls in order to overweight a stock by more than its index weight, then you will need to pay margins on the extra amount. Margins are not required on bought options.

Generating Income for the Portfolio

One way to generate income for your enhanced index portfolio is by selling options. Whether or not you have already tilted your underlying index portfolio, you can introduce an extra level of performance enhancement by selling options over the stocks you hold.

Assume that your initial portfolio is an index portfolio of long stocks. You may have already implemented a directional tilt by overweighting your favoured stocks and underweighting your unfavoured stocks.

There will be many other stocks in your portfolio that remain at index weight because you think they are fairly priced. If you think that the prices of some of these shares are likely to remain at or around current levels for the period ahead, you can sell puts and calls of the appropriate expiry date. This will generate premium income and thus enhance performance. The potential excess return can be obtained with relatively low tracking error at the aggregate level.

Crucially, you must be prepared to sell these stocks if the price rises, or to buy more if the price falls. The strike prices at which you sell puts and calls will depend on your view of the likely range in which the share price will move during the life of the options. If you sell out-of-the-money puts and out-of-the-money calls on the same stock, in equal numbers, this effectively becomes a 'strangle'.

Implementation

The strategy involves selling a put option with a strike price lower than the current stock price, and selling a call option with a strike price higher than the current stock price. One put and one call are sold for every 1000 shares held in the underlying stock.

If the share price at expiry of the options is between the strike prices of the sold call and the sold put, both options will expire worthless, giving you the benefit of two option premiums. The strategy reflects a neutral market view, where you expect the stock to trade in a range until the expiry of the options. Before implementing this strategy, you need to be sure that you will be content to lose your stock at the strike price of the sold call, and equally content to buy more stock at the strike price of the sold put.

If the share price at expiry is above the strike price of the sold call, the option will be exercised and you will sell your shares at a higher price than they were trading at when you wrote the options. If the share price at expiry is below the strike price of the sold put, the option will be exercised and you will end up buying more stock.

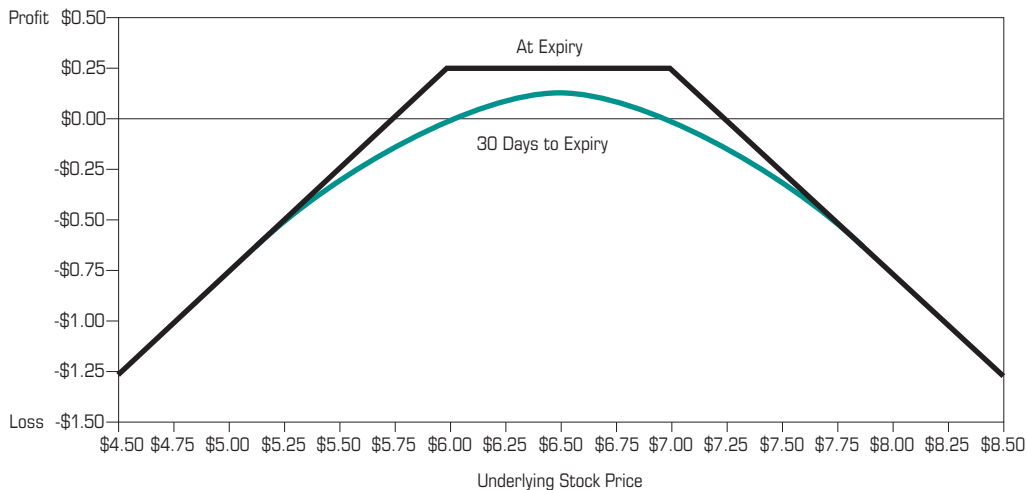
However, because you have received two option premiums, your average entry price for your total shareholding is lowered. If the stock price at expiry is between the strikes of the two options, you will have benefited from the receipt of the two option premiums, and still retain ownership of your shares.

Example

You hold 100,000 shares of NNN, which is index weight in your portfolio. On August 26, NNN shares are trading at \$6.50. Your view is that the NNN share price will likely stay in the range of \$6.00 to \$7.00 during the next two months. October \$7.00 calls are trading at \$0.125, and October \$6.00 puts are trading at \$0.125. You decide to enhance the return on your portfolio by selling options over your stock.

Short Strangle

Short \$6.00 Put at \$0.125 + Short \$7.00 Call at \$0.125



You implement the following options trade:

Sell 100 October NNN \$7.00 calls @ \$0.125

Sell 100 October NNN \$6.00 puts @ \$0.125

Total premium received \$0.25

You will achieve maximum profit of \$0.25 if the share price is range bound by the two strikes (\$6.00 to \$7.00) during the life of the option. However, you will still make a profit from the trade if the share price stays above \$5.75 and below \$7.25.

Receiving premium income of \$0.25 represents an enhancement of approximately 3.8% on the returns on this stock if the options expire worthless.

If the price of the stock rises significantly during the life of the options, and your stock is called away at \$7.00, you will still be showing outperformance on this stock so long as the price does not rise above \$7.25. The upside risk of the sold call option is covered by your share holding, but if the share price rises above \$7.25 you will underperform the benchmark return for this stock.

On the downside, if the price falls below the lower strike and you are put stock at \$6.00, you will still show outperformance on this stock so long as the price does not fall below \$5.75. If the price falls below \$5.75, your effective entry price to the stock, you will be making losses on the stock and making a negative contribution to benchmark returns.

Time decay works in favour of both legs of the strategy. Ideally, the strategy is implemented when implied volatility of the options is relatively high, and you expect volatility to decline over the duration of the strategy.

Points to remember

- 1 You must be happy to lose your stock at a price higher than current levels, and equally happy to buy more stock at a price lower than current levels.
- 2 If either the put or the call becomes in-the-money, you may choose to buy it back before expiry to avoid exercise.
- 3 If you do buy back one leg at a loss, you may also choose to buy back the other leg at the same time at a profit to avoid the possibility of the stock price movement reversing and losses being suffered on both legs of the strategy.

Main benefits of the options strategy

- 1 You benefit from receipt of two premiums. This creates a wider trading range for the strategy to remain profitable.
- 2 Time decay works strongly in your favour.
- 3 If you can identify stocks with higher than average volatilities that you think will trade within a certain price range, the strategy can be especially profitable.

Main risks of the options strategy

- 1 The main physical risk is on the downside. If the share price falls significantly, you will end up holding more shares when the put is exercised and you will underperform benchmark returns for this stock.
- 2 A strong rise in the share price will result in the loss of your existing shareholding. There is no physical risk on the upside because you are covered by your share holding, but the opportunity cost of missing out on gains above the sold call strike price means that you will underperform benchmark returns for this stock.
- 3 Naked sold puts leave you exposed to margin calls.
- 4 An increase in volatility will make both sides more expensive to buy back before expiry.

Characteristics of the options strategy

<i>Objective</i>	To enhance the returns on your portfolio by generating premium income.
<i>Construction</i>	Sell out-of-the-money puts and sell out-of-the-money calls over stocks in your portfolio.
<i>Market view</i>	Neutral: the share price will be range bound by the upper strike and lower strike during the life of the options.
<i>Maximum profit</i>	Premium income received, plus any capital appreciation in the stock up to the higher strike price.
<i>Maximum loss</i>	Price of stock at the time of writing options, less the premium income received. Maximum loss would occur on the downside when share price falls to zero and you are put stock at the lower strike price. Physical upside risk is constrained since calls are covered; however, potential opportunity cost could still mean that you underperform the benchmark returns for that stock.
<i>Time Decay</i>	Time decay works strongly in your favour since both options are sold.

Volatility Increase in volatility works strongly against you, but decrease in volatility works strongly in your favour.

Margins Yes: margins will be payable on sold puts, but not on sold calls, as long as underlying stock is lodged as collateral.

Questions and Exercises

- 1 Why is it that using options to tilt your portfolio away from index is able to add more value than simply creating overweights and underweights in your physical stock holdings?
- 2 What is another advantage of using options to implement a portfolio tilt?
- 3 Do you need to pay margins when you use sold calls to implement a portfolio tilt?
- 4 How can you use options to enhance the return on the stocks in your index portfolio?
- 5 In order to implement a strangle to raise premium income, which of the following do you do?:
 - a) sell a call option with a strike price lower than the current stock price, and sell a put option with a strike price lower than the current stock price
 - b) sell a call option with a strike price higher than the current stock price, and sell a put option with a strike price higher than the current stock price
 - c) sell a call option with a strike price lower than the current stock price, and sell a put option with a strike price higher than the current stock price
 - d) sell a call option with a strike price higher than the current stock price, and sell a put option with a strike price lower than the current stock price.
- 6 Does time decay work against or in favour of the sold strangle?

8. Strategies for Absolute Return Managers

Absolute return strategies typically have risk-return profiles that are higher than those of traditional investment classes, and achieve returns that are not related to any particular underlying benchmark. Because absolute return strategies aim to generate profits that have very low levels of correlation to returns from existing asset classes, they add diversification benefits to your portfolio. In addition, absolute return strategies have the potential to achieve positive returns even when traditional equity markets are falling.

Options strategies employed by absolute return managers are extremely varied. Many absolute return managers and hedge fund managers employ dynamic trading strategies which are beyond the scope of this Handbook. Others aim to achieve strong returns through more straightforward option strategies such as the buy-write (see Chapter 3).

While some absolute return strategies, such as arbitrage strategies, may have low risk profiles, others can carry high risk. For example, the use of derivative instruments such as options to achieve the portfolio's objectives can increase risk, especially when investments are leveraged to boost returns.

Absolute return strategies are often opportunistic in nature. These include earnings season strategies that hinge on dividend payments, and event-driven strategies that aim to profit from special situations or opportunities. Some managers may use leverage to increase their exposure to an investment thereby accentuating the profit and loss potential. This chapter looks at three types of absolute return strategies that involve the use of equity options:

- i earnings season strategies
- ii event driven strategies
- iii creating leverage.

Earnings Season Strategies

Equity options can be used in earnings season strategies such as dividend strategies. This section explores a strategy sometimes referred to as a 'synthetic call' which is an option

combination strategy that allows you to build a low-risk and potentially high reward options position.

The position is called a synthetic call because it has essentially the same risk-reward profile as a call option, but comprises a long stock position plus a long put¹⁶. The appeal of this strategy is that by being long the physical stock you are able to capture the dividend which effectively pays for the cost of the call. The result is that you are obtaining a free out-of-the-money call option.

Implementation

The synthetic call is constructed by simultaneously purchasing an in-the-money put option together with 1000 shares of a stock on which you have a positive market view and which you expect will pay a sizeable dividend.

The purchase of this stock is consistent with your view of its expected price appreciation and its expected dividend. The purchase of the in-the-money put provides you with a guaranteed sale price at higher than current market levels.

The one disadvantage is the price of the put. Deep in-the-money puts are expensive, as you are paying for a lot of intrinsic value. Nevertheless, the in-the-money put provides extremely robust downside protection in case your stock view proves incorrect (see Chapter 3 'Protection for stocks'). So robust, in fact, that you have a guarantee (for the life of the option) of being able to sell the stock for more than you paid for it.

Although deep in-the-money options have significant intrinsic value, they have the lowest time value component compared to their at-the-money and out-of-the-money counterparts, and we want to pay as little time value as possible for our protection policy.

The further the put is in-the-money, the higher its intrinsic value, and the lower its time value.

The plan is that the dividend of the underlying stock will partly or wholly cover the cost of the time value of the put option. This effectively reduces or eliminates the risk of the synthetic call position.

¹⁶ A synthetic call is constructed as follows: $+C = +U + P$

Example

Assume it is early July, and you have formed a positive view of MNO Corporation which is currently trading at \$12.00. You expect that this company will pay a 5% dividend in August, and you also think that the share price is likely to appreciate over the coming year.

You want to add this stock to your portfolio, and so you purchase 100,000 shares of MNO at \$12.00. Simultaneously, you buy 100 June \$14.00 put options at \$2.60.

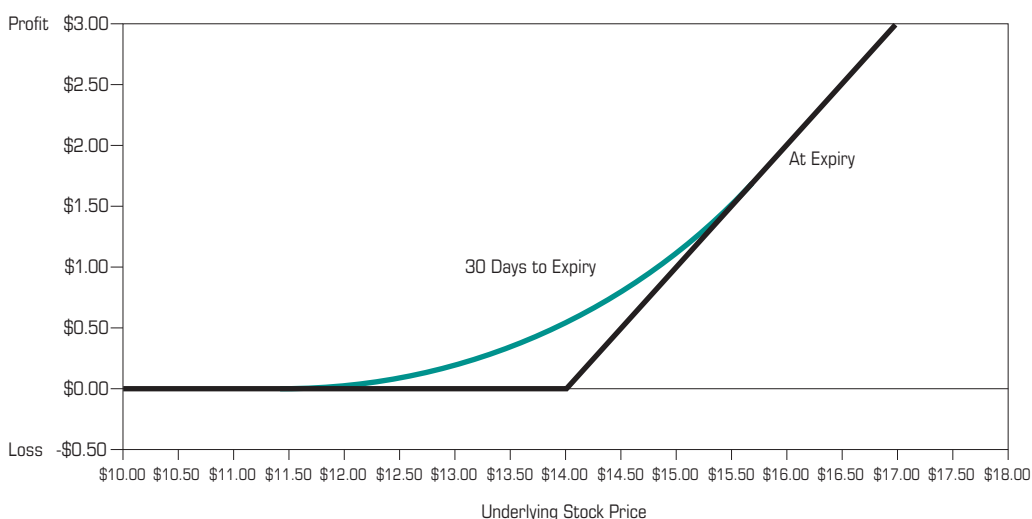
Buy 100,000 shares MNO @ \$12.00
Buy 100 June MNO \$14.00 puts @ \$2.60

You have paid a total of \$14.60 for your stock plus options position. You are long stock and you have your stock protection in place so that you can exit your position at any time over the next year at \$14.00. Therefore, your net risk on the position is \$0.60.

In August, MNO pays a 5% dividend as expected. You receive \$0.60 per share. This dividend eliminates the risk of your synthetic call position. In effect, you are left with unlimited profit potential after the stock rises above \$14.00, and your position has zero downside risk. Transaction costs have been ignored for simplicity.

Synthetic Call

Long Stock at \$12.00 + Long \$14.00 Put at \$2.60 + \$0.60 Dividend



Stocks with high dividend yields are preferred for this strategy. An additional attraction is that if the dividends are franked you will receive tax advantages, provided you meet the 45 day rule.

In addition, this strategy leaves you to reap the benefits of any appreciation in stock price above \$14.00.

This strategy is best implemented with long dated options to allow plenty of time for the share price to appreciate above the strike price. Stocks exhibiting low implied volatility are also desirable so that the amount you pay for time value is minimised.

Points to remember

- 1 Choose a stock that you think has potential for price appreciation.
- 2 Choose a stock that you think will pay a good dividend.
- 3 Best if stock has low implied volatility.
- 4 Buy in-the-money put options because they have the lowest time value component.
- 5 Buy long-dated put options.
- 6 Stocks with franked dividends can bring tax advantages.

Main benefits of the options strategy

- 1 You have a long stock position with low cost protection against downside risk.
- 2 Can also be viewed as a low cost way of obtaining an out-of-the-money call option with unlimited upside potential and little (or no) downside risk.
- 3 Can also be viewed as a way of capturing the stock's dividend with a (synthetic) call position (when normally bought calls do not entitle the holder to dividends) and using that dividend to pay for the out-of-the-money synthetic call.
- 4 Risk is low.
- 5 Franked dividends can bring tax advantages.

Main risks of the options strategy

- 1 Stock does not pay a dividend large enough to cover the time value component of the put option premium.
- 2 You pay away your dividend in order to implement the position.

Characteristics of the options strategy

<i>Objective</i>	To exchange your dividend for a risk free position with unlimited upside potential.
<i>Construction</i>	For every 1000 shares held, buy one in-the-money put option.
<i>Market view</i>	Positive on the stock. Expecting share price to rise above strike price of in-the-money put. Also expecting a sizeable dividend.
<i>Maximum profit</i>	Unlimited.
<i>Maximum loss</i>	Zero (so long as the dividend payment received covers the cost of the time value component of the put option premium).
<i>Time Decay</i>	Time decay works against the bought put.
<i>Volatility</i>	Increase in volatility works in favour of the bought put. Decrease in volatility works against the bought put.
<i>Margins</i>	No.

Event-Driven Strategies

Event-driven strategies aim to profit from special events or situations that arise in the equities market. These are opportunistic strategies, usually aimed at taking advantage of an anticipated price movement that is the direct result of a particular event.

Event-driven strategies often focus on corporate life-cycle investing and involve identifying opportunities created by significant corporate events such as special announcements, mergers and acquisitions, distressed company reorganisations, or share buy-backs.

We will be exploring a strategy called the 'long straddle' that is suitable in these type of situations.

Long straddle

Where you expect a sharp movement in the share price, but are unsure of the direction it will take, the long straddle is an appropriate strategy. This might occur when the share price has been quiet or trading in a trend channel and you expect it to start moving but are not sure which way it will go. The strategy can be especially good if the market has been quiet, and then starts to zigzag sharply, signalling a potential break out.

Certain corporate events can cause this type of share price behaviour. For example, consider a pharmaceutical company that has patented a new 'wonder drug' and has applied to the FDA for approval to market the product. You know that the FDA is scheduled to make an announcement on a particular day as to whether approval has been granted. You don't know which way the decision will go, but you do know the result will be critical for the company's prospects. You expect the FDA announcement will cause the share price either to climb steeply or to plummet.

Implementation

The strategy is implemented by the simultaneous purchase of an at-the-money call option and an at-the-money put option with the same expiry date. That is, the call option and the put options have the same strike price, usually close to the current market price of the underlying share.

At expiry, the investor will make profits if the share price has moved strongly enough in either direction to cover the cost of the two options. Profits can be taken early in the life of the straddle, but only if the expected movement occurs quickly. As the market moves strongly in one direction, the gain made on one leg exceeds the loss incurred on the other, and the straddle increases in value.

Because the long straddle involves the purchase of two options, it is a relatively expensive strategy. To undertake the bought straddle you must be expecting a significant move in the share price.

Profit potential is open-ended in either direction. At expiry, profit is equal to the difference between the share price and strike price minus the cost of the combination. Profits will be greater the further the share price has moved from the strike price. This position is seldom held until expiry, however, because of the damaging effects of time decay. Profits are usually taken early to avoid losing all the time value of the options. In particular, early volatility presents the opportunity to take profits from the straddle before expiry.

Other considerations

Time decay is an important issue with the long straddle. The position consists of two long options. As a result, time decay works strongly against the strategy. The longer the straddle is left in place, the greater the loss due to time decay. The position must therefore be closely monitored and may need to be closed out well before expiry.

The choice of expiry month is another important consideration. You need to balance the cost of the strategy against the time needed to give it the best chance of success. The more distant expiry months will provide the strategy with more time, however longer dated options will be more expensive than those with shorter dates.

Follow-up action

The buyer of a straddle expects volatility in the market to increase. Only rarely will this strategy be held to expiry. If the investor's market view proves correct, the straddle should be unwound to crystallise profits. The position can be liquidated on both sides simultaneously or, if the out-of-the-money option has little value it could be left open in case the market were to reverse.

If volatility does not increase as expected, the strategy should be taken off well ahead of expiry, before time decay damages the position.

Example

ABC Limited is a gold mining company which has been involved in an extensive exploration program over the last few months. The results of this program are due to be made public in a month. If significant reserves have been discovered, the stock price will show large gains.

You believe, however, that if the exploration program proves unsuccessful, ABC's share price will fall sharply. You also believe the price of gold is likely to be volatile over the next six months. The current share price, at the end of July, is \$4.90. You decide to buy a straddle.

Buy 1 Nov \$5.00 Call @ \$0.38

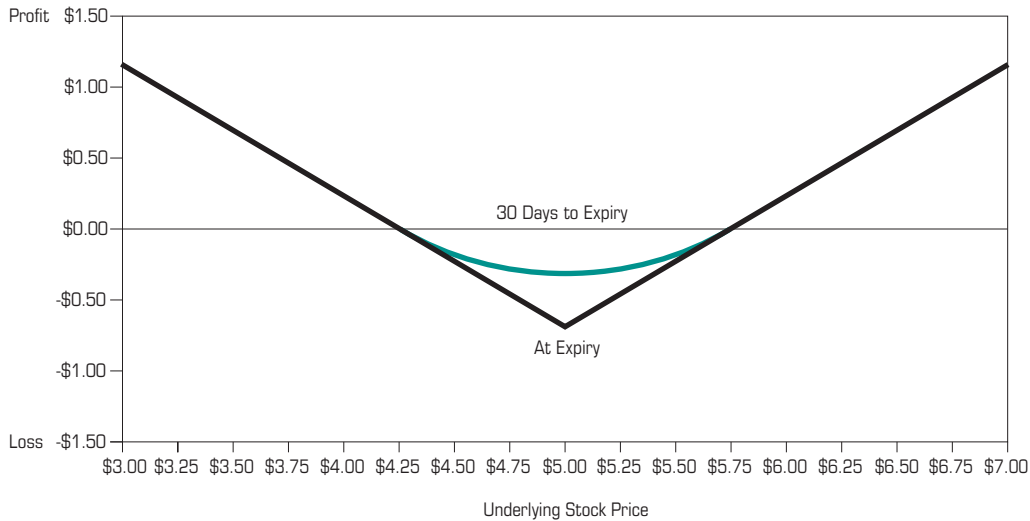
Buy 1 Nov \$5.00 Put @ \$0.38

Total cost of long straddle \$0.76

If the price of ABC moves by more than \$0.76 away from the common strike price of \$5.00, your position will show a profit. Breakeven is \$5.76 on the upside, and \$4.24 on the downside.

Long Straddle

Long \$5.00 Call at \$0.38 + Long \$5.00 Put at \$0.38



Points to remember

- 1 The long straddle is best entered into when volatilities are low.
- 2 Choose options on a share that you expect will become more volatile.
- 3 This strategy needs time to achieve the best results. However, long-dated options are more expensive than those with shorter expiry dates, so you need to weigh up the cost of the strategy with the time required to achieve a result.
- 4 If your expectations of the market movement are correct and volatility increases, you can unwind the straddle by liquidating both sides simultaneously. If the out-of-the-money option has little value, you can leave it open to take advantage of a possible market reversal.
- 5 Time decay accelerates as options approach expiry. For this reason, the position is best suited to early profit-taking.
- 6 Even if volatility does not increase, be prepared to unwind the strategy well before expiry (at a loss if necessary), in order to minimise the effect of time decay.
- 7 Because of the damaging effects of time decay, consider using a 'time stop'.

- 8 Risk is limited, but the straddle should not be viewed as a low risk strategy because you are paying for two options, both of which are damaged by time decay.
- 9 If you are expecting a very large breakout, consider the strangle (which involves the purchase of out-of-the-money puts and calls) which will be cheaper and have greater leverage.

Main benefits of the options strategy

- 1 Provides exposure to both a rise and a fall in the market.
- 2 Possibility of unlimited profits.

Main risks of the options strategy

- 1 Volatility falls, and the share price remains steady. In order to make a profit, the share price must move significantly.
- 2 Time decay works strongly against this strategy, as it consists of two bought options.

Characteristics of the options strategy

<i>Objective</i>	To profit from an expected significant movement in the share price when you are unsure of the direction of the move.
<i>Construction</i>	Simultaneous purchase of an at-the-money call and an at-the-money put option with the same expiry date and same strike price.
<i>Market view</i>	You expect a sharp movement in the share price but are unsure which direction it will take.
<i>Maximum Profit</i>	Unlimited for either an increase or decrease in the price of the underlying share.
<i>Maximum Loss</i>	Loss is limited to the premium paid in establishing the position. Loss will be greatest if the share price is at the strike price at expiry.
<i>Time decay</i>	Hurts because you have double time erosion because of the two bought options.
<i>Volatility</i>	An increase in volatility works strongly in favour of the position. A decrease in volatility works strongly against the position.
<i>Margins</i>	No.

Creating Leverage

The delta of a call option can be thought of as representing the likelihood that the option will be exercised. All call options¹⁷ have a delta that lies in the range of 0 to 1. If the delta is close to zero, it is very unlikely that the option will be exercised. If the delta is close to 1, the option will almost certainly be exercised. If the delta is 0.5, the option has an even chance of being exercised.

It follows that an option with a delta of 0.5 has an absolute profit potential (or expected outcome) that is half that of the underlying share. Another way of looking at it is that a \$1 move in the share will result in an approximate \$0.50 move in the option. The fact that the delta of a call option must always be within the range of 0 to 1 illustrates the point that, in absolute terms, there is a greater profit (and loss) potential in trading a set quantity of underlying shares than there is in trading the options on those shares.

Rate of return

What we have seen above relates to profit in absolute terms – dollars and cents. It does not relate to the rate of return. In trading options, you pay a relatively small premium to create a relatively large exposure. This means that you can make large percentage gains from comparatively small percentage moves in the underlying stock. This is how options can create leverage. However, leverage also has downside implications. If the underlying stock price does not rise or fall as anticipated during the lifetime of the option, leverage can also magnify your loss.

This aspect of options trading, the ability to create leverage, is of particular interest to equity managers, who are usually very conscious of their rate of return.

Most equity managers have cash limitations. A range of investment opportunities compete for scarce funding resources. It can be advantageous to control a \$2 million investment in a stock for, say, 3% of the value (ie. \$60,000). You don't own the stock, you control it, but you do 'own' the investment's profit or loss. So, if the \$2 million worth of stock increases in value, say, to \$2.1 million, you own the profit of \$100,000. The value of the stock has increased by 5%, but the value of your investment has increased by 66%. This is leverage.

¹⁷ Put options have a delta that lies in the range of 0 to -1.

Example

Buying call options gives you exposure to a rise in the share price for a fraction of the cost of purchasing the shares themselves. Because of the small initial outlay, you are gaining leveraged exposure to share price moves.

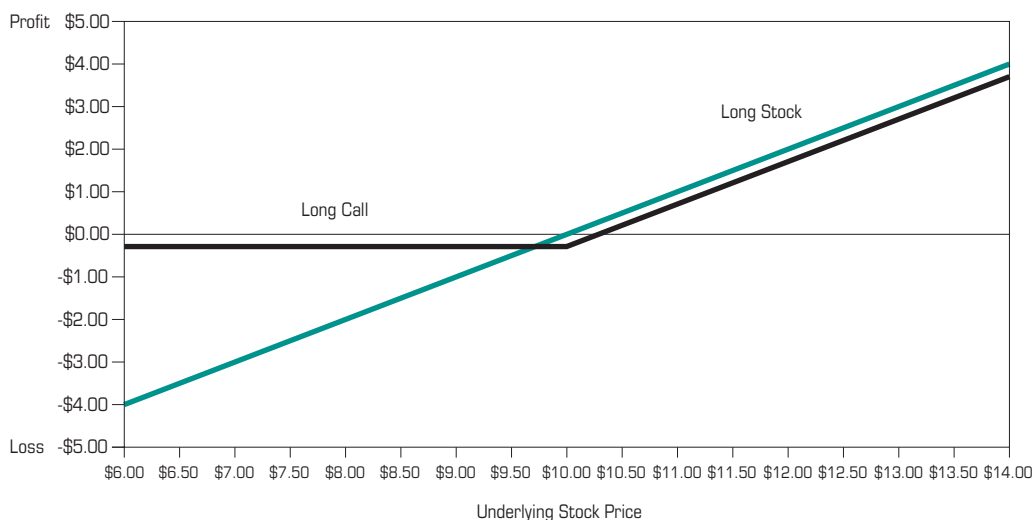
Consider the risk-reward characteristics of an investment in physical equities compared to an investment in call options.

Suppose that shares of JKL Ltd are currently trading at \$10.00. Your view is that the share price will rise by around 10% over the next three months and you plan to make a purchase for your portfolio. You pay \$1 million to buy 100,000 shares and hold the position for three months.

At the end of that period, if JKL is trading at \$11.00 as expected, you will have made a profit of \$100,000 which represents a return of +10%. On the other hand, if JKL is trading at \$9.00, you will have made a loss of \$100,000 which is a return of -10%.

Now suppose that, instead of taking a position in physical JKL stock, you purchase 100 three-month at-the-money call options. These are trading at \$0.25, so you spend \$25,000 to buy 100 call options. At the end of three months, if JKL is trading at \$11.00, the options will be worth \$1.00 each, and you will have made a profit of \$75,000 which represents a return of +300%. If the stock is trading at \$9.00, the options will expire worthless and you will have made a loss of \$25,000 which is a return of -100%.

Buying Stocks vs. Buying Calls Long Stock at \$10.00 vs. Long \$10.00 Call at \$0.25



The *absolute* return (or loss) is greater in the case of buying the physical stock, but the rate of return (or loss) is greater in the case of buying the call options.

Maximising leverage

The equivalent amount of exposure can be acquired via options for less outlay than via purchase of physical stock. With an increase in the price of the underlying shares above the strike price, the percentage return on the purchase on a call option will be greater than on the purchase of the underlying stock.

This strategy works best when your view on the stock is that the share price will rise above the strike price. The higher the market moves, the more leverage can be created by the purchase of calls instead of the physical shares. The more bullish your view, the further out-of-the-money you should purchase your calls to increase the degree of leverage.

What if your stock view proves incorrect?

If the share price does not move as expected, you can either close out the option before expiry to recoup some of your initial investment, or simply let the option expire worthless.

When you buy a call option, the most you can lose is the premium you have paid. Even so, just as leverage provides the potential to make higher percentage returns, it also involves the risk of making larger percentage losses.

Points to remember

- 1 Leverage (or 'gearing') means that small sums of money can exert disproportionately greater transaction muscle.
- 2 The smaller the initial outlay relative to the asset controlled, the larger the leverage.
- 3 Leverage increases not only your profit potential, but also your loss potential.
- 4 Other option strategies where margins are payable (sold options) will reduce your leverage.

Main benefits of the options strategy

- 1 For a smaller outlay, you obtain the equivalent amount of exposure to a movement in the share price.
- 2 You have the potential to make greater percentage gains.
- 3 Your risk-return profile is asymmetric such that you have the potential to make unlimited absolute profits, but your losses are limited to the cost of the call options.
- 4 Remainder of funds allocated to stock (if applicable) can be invested in cash-equivalents to earn interest.

Main risks of the options strategy

- 1 You have the potential to make larger percentage losses.
- 2 Time decay works against you.

Characteristics of the options strategy

<i>Objective</i>	To obtain leveraged exposure to a movement in the share price.
<i>Construction</i>	Buy calls.
<i>Market view</i>	Bullish: the share price will rise above the strike price plus the premium paid for the options. The more bullish you are, the further out-of-the-money you can buy the calls to create maximum leverage.
<i>Maximum profit</i>	Unlimited.
<i>Maximum loss</i>	Premium paid for the call options.
<i>Time Decay</i>	Time decay works against the bought calls.
<i>Volatility</i>	Increase in volatility works for you, but decrease in volatility works against you.
<i>Margins</i>	No.

Questions And Exercises

- 1 A synthetic long call comprises which of the following combinations:
 - a) short stock plus short put
 - b) short stock plus long put
 - c) long stock plus short put
 - d) long stock plus long put.

- 2 Other things being equal, which of the following is more expensive:
 - a) in-the-money put
 - b) at-the-money put
 - c) out-of-the-money put.

- 3 Other things being equal, which option has the lowest time value:
 - a) in-the-money put
 - b) at-the-money put
 - c) out-of-the-money put.

- 4 A long straddle comprises which of the following:
 - a) a long at-the-money call plus a long at-the-money put with different expiry dates
 - b) a long at-the-money call plus a long at-the-money put with the same expiry dates
 - c) a long out-of-the-money call plus a long out-of-the-money put with different expiry dates
 - d) a long in-the-money call plus a long in-the-money put with the same expiry dates.

- 5 Which of the following statements is true:
 - a) time decay and an increase in volatility both work in favour of the long straddle
 - b) time decay and a decrease in volatility both work in favour of the long straddle
 - c) time decay and an increase in volatility both work against the long straddle
 - d) time decay and a decrease in volatility both work against the long straddle.

- 6 Which of the following statements is true:
 - a) an option has a greater proportionate rate of return and a greater absolute return than the underlying share
 - b) an option has a greater proportionate rate of return and a lesser absolute return than the underlying share
 - c) an option has a lesser proportionate rate of return and a lesser absolute return than the underlying share
 - d) an option has a lesser proportionate rate of return and a greater absolute return than the underlying share.

- 7 An option with a delta of 0.5 is most likely to be which of the following:
 - a) in-the-money
 - b) out-of-the-money
 - c) at-the-money.

9. Case Studies

This chapter explores four case studies:

- i reducing market risk
- ii reducing specific risk
- iii deriving income from physical stock
- iv creating a substitute for physical stock.

Reducing Market Risk

One way of protecting your share portfolio against a fall in the stock market (market risk) is to buy put options over the individual stocks in your portfolio. This, however, is a transaction-intensive approach.

Index options

An alternative is to buy index put options. S&P/ASX 200 options, for example, allow you to trade a view on the market as a whole. Index options give you exposure to the securities that make up a stockmarket index. They allow you to trade a view on the market as a whole, or on the market sector covered by the particular index.

Unlike standard ASX traded equity options, index options are European style. This means that you are not able to exercise an index option until expiry. However, you are able to close out your position by selling the option at any time up until expiry. Index options are cash settled, rather than deliverable.

Buying an index put option enables you to obtain protection for your portfolio against market risk. If your bearish market view proves correct, the profits on the put option will at least partly compensate you for the loss in value of the stocks in your portfolio.

Implementation

Suppose you have a broad-based portfolio worth \$10 million at the start of July. Your market view is bearish over the next three months.

On 1 July, the S&P/ASX 200 index stands at 3228 points. At this time, you can buy 300 September S&P/ASX 200 3300 index puts to protect your portfolio. Each option costs 97 points, or \$970.

Each contract effectively 'insures' \$33,000 of stock, ie. 3300 points at \$10 per point:

- If the S&P/ASX 200 index falls, the put options will increase in value, offsetting the fall in value of your portfolio.
- If the index goes up, the value of your shares will increase and the put options will fall in value.

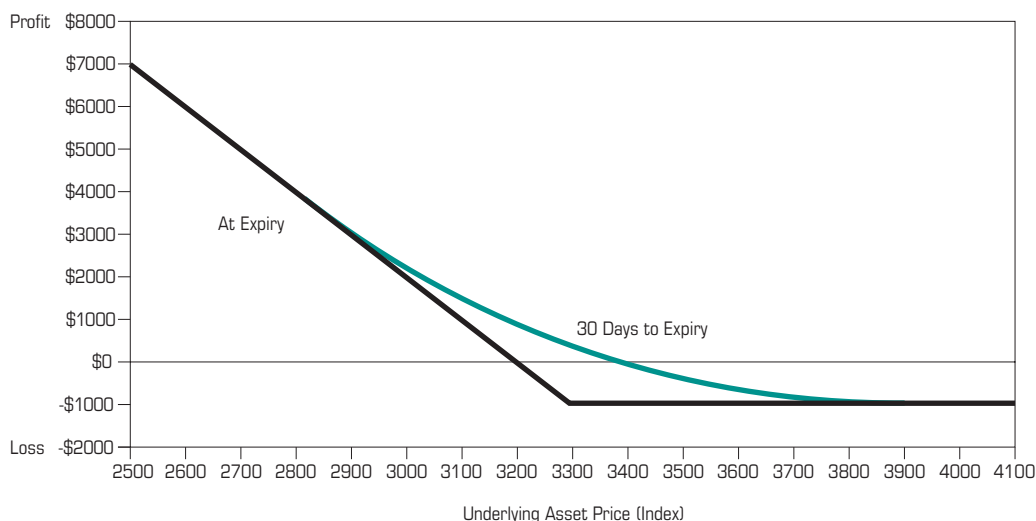
Unwinding your position

On 6 August, the index has fallen to 2964 points, and the September 3300 put options are trading at 339 points or \$3,390. This represents an unrealised profit of \$2,420 per contract. These profits offset the loss in value of your share portfolio.

At this point you may choose to sell your put options at a profit, in the belief that the market will recover. If, however, you fear that the market may have further to fall, you could keep the puts in place.

The graph over the page shows the profit/loss result if you were to hold the put option until expiry in September. The payoff diagram shows the profit/loss for the option position, and does not take into account the stock portfolio.

Long 3,300 Put at 97 Points Index Options



You do not have to hold your options until expiry. In order to avoid the effects of time decay at its most damaging, it is often wise to re-evaluate your position at least a month before expiry. For example, with some time left before the expiry of the options, there are a number of choices open to you, including the following:

1 Close the position out

By selling your options you can either take profits early, or recover some value from a losing position, thereby removing the possibility of a total loss of the premium initially invested.

2 Leave the position in place

If you believe the market is likely to fall over the remaining life of the option, this course of action may be the most appropriate.

3 Roll the position to a later month

If you believe that the market is going to fall further over the period ahead, you could roll the position out. This involves selling the September options and buying options expiring in the next expiry month, December.

4 Adjust the position to a different strategy

If your market view has changed, a different strategy may be more appropriate. For example, if you now believe the market is likely to stay around current levels until the September expiry, you could close out your put options and write September calls.

Points to remember

- 1 The strategy is suitable to protect a broadly-based share portfolio.
- 2 To minimise the effects of time decay, re-evaluate your position well before expiry.

Main benefits of the options strategy

- 1 Index puts enable you to protect the value of your share portfolio.
- 2 Buying index puts is a simpler and less time-consuming technique than buying put options over the individual stocks in your portfolio.

Main risks of the options strategy

- 1 Unless your portfolio is exactly index weighted, the movement in value of your portfolio may not match the movement in value of the index. This discrepancy can work either in your favour or against you.
- 2 Time decay works against the bought options.

Characteristics of the options strategy

<i>Objective</i>	To protect your portfolio from market risk (a fall in the stock market).
<i>Construction</i>	Buy index put options.
<i>Market view</i>	Short-term bearish.
<i>Maximum profit</i>	Strike price of options less premium paid.
<i>Maximum loss</i>	Premium paid.
<i>Time Decay</i>	Works against bought options.
<i>Volatility</i>	An increase in volatility works in favour of bought options.
<i>Margins</i>	No.

Reducing Specific Risk

The classic way of using options to reduce the specific risk of an equities portfolio is to buy protective put options. This has already been discussed in Chapter 3 ('Protection for Stocks').

This case study gives a worked example of how buying put options guarantees the sale price of your shares for the life of the option. This strategy can be especially useful if you are concerned about a short-term fall in the value of the shares but remain bullish in the longer term.

Implementation

You are concerned about a temporary fall in the price of AAA stock over the next two months.

On 1 August, AAA closes at \$14.11. At this point, you are able to reduce the specific risk of this stock by buying September expiry put options, which are available at the following prices:

AAA Sep 1350 Put @ \$0.37

AAA Sep 1400 Put @ \$0.51

All other things being equal, the lower the strike price of a put option (i.e., the further out-of-the-money), the less will be the premium paid for protection. However, this also means that your stock is protected at a lower level and therefore that specific risk has not been reduced by as much. A balance must be reached between risk and return.

Which option you choose will depend on your view of the stock.

Stock View

The balance reached will depend on your view of the likely share price movement during the life of the option. For example, if you think that the AAA share price will fall by no more than, say, 4%, before the expiry date of the option, there is little point buying the 1350 strike, as it is more than 4% out-of-the-money.

In general, the further out-of-the-money the put option, the less specific risk reduction it provides. Another perspective is that far out-of-the-money puts provide protection only against rare and extreme events, and can be considered as 'disaster protection'. Naturally, protection against unlikely events will be considerably cheaper than protection against commonplace events.

Unwinding your position

By 26th September (options expiry day) AAA shares have fallen to \$12.23, and both options have increased in price. The September 1350 Put is worth \$1.27, while the September 1400 Put is worth \$1.77. The profit you have made on the option has offset the fall in value of the shares.

The following table shows the net position:

DATE		SHARES ONLY	SHARES +1350 PUT	SHARES +1400 PUT
Aug 1	Shares	14.11	14.11	4.11
	Put Options	–	(0.37)	(0.51)
	Net Position	14.11	13.74	13.60
Sep 26	Shares	12.23	12.23	12.23
	Put Options	–	1.27	1.77
	Net Position	(1.88)	(0.98)	(0.62)

From the table you can see that the out-of-the-money option (the 1350 put) is cheaper than the at-the-money option (the 1400 put), but the at-the-money option provides greater protection.

At the expiry of the option, you have two choices:

- exercise the option and sell your AAA shares
- sell your put option and retain your shares.

The choice you make depends on whether you wish to continue holding your AAA shares. Note that you do not have to wait until expiry to either exercise or sell your option.

Points to remember

- 1 Reducing the specific risk of a stock in your portfolio can be useful when you have a longterm bullish view of the stock, but are concerned about a short-term fall in the price.
- 2 Buying puts to 'insure' a stock is viable for short periods but not for long periods, due to the expense of the option premiums.
- 3 If you think that the share price decline will be sustained it is preferable to sell your holding of the stock.

Main benefits of the options strategy

- 1 Put options enable you to reduce the specific risk of a particular share and thereby protect the value of that share holding.
- 2 If the share price rises, you still benefit from the increase in value of your shares (less premium paid).

Main risks of the options strategy

- 1 Time decay works against the bought option.
- 2 It is not cost-effective to have protection in place twelve months of the year. The strategy is generally appropriate for shorter periods where you expect the share price may decline.

Characteristics of the options strategy

<i>Objective</i>	To reduce the specific risk of your stock holding during an anticipated short-term decline in the share price.
<i>Construction</i>	Buy put options with a strike price at-the-money or out-of-the-money depending on your market view.
<i>Market view</i>	Cautiously bullish. Your view is that the share price will rise in the longterm, but you are concerned about a possible fall below the strike price in the short-term.
<i>Maximum profit</i>	Your maximum profit on the net position of stock plus put options is unlimited because you will profit from a sustained increase in the share price.
<i>Maximum loss</i>	The premium of the bought puts plus the difference between the current market price and the strike price of the puts. (In contrast, without the bought puts, your maximum loss on the share holding is the price you paid for the stock).
<i>Time Decay</i>	Time decay works against the bought puts.
<i>Volatility</i>	An increase in volatility will work in favour of the bought puts.
<i>Margins</i>	No.

Deriving Income from Physical Stock

Writing covered calls is the main way of using options to generate income from your physical stock. This strategy has already been discussed in Chapter 3 ('Increasing the Yield on an Equity Portfolio').

This case study gives a worked example of writing covered calls to derive income from your stock.

Writing calls

In selling a call option, you accept the obligation to sell the underlying stock at the exercise price at any time up until the option's expiry, if the option is exercised. This strategy is generally used when you expect the share price to remain steady over the life of the option.

The written call can provide you with extra income in flat or falling markets. If the share price at expiry is below the strike price of the option, the option will expire worthless, and you will have benefited from the premium income. If the share price at expiry is above the strike price of the option, the option will be exercised, and you will have to sell your shares. Your effective sale price is the strike price of the option plus the premium you received for writing the call.

Implementation

In mid June, when CCC shares are trading at \$20.50, you are able to write call options at the following prices:

July 2050 Call @ \$0.50
July 2100 Call @ \$0.25

The further out-of-the-money the calls, the lower the premium income received. The tradeoff is that the further out-of-the-money the calls, the less likely they are to be exercised and the more likely you are to capture the premium without having to sell your stock at the strike price. In addition, the further out-of-the-money the calls are, the higher your effective sale price if the option is exercised.

Unwinding your position

In flat or falling markets, the most common method of exiting your position is simply to wait until the options expire worthless. This requires no action on your part, and incurs no further transaction costs.

Alternatively, you may choose to close out your position by buying the options back prior to expiry.

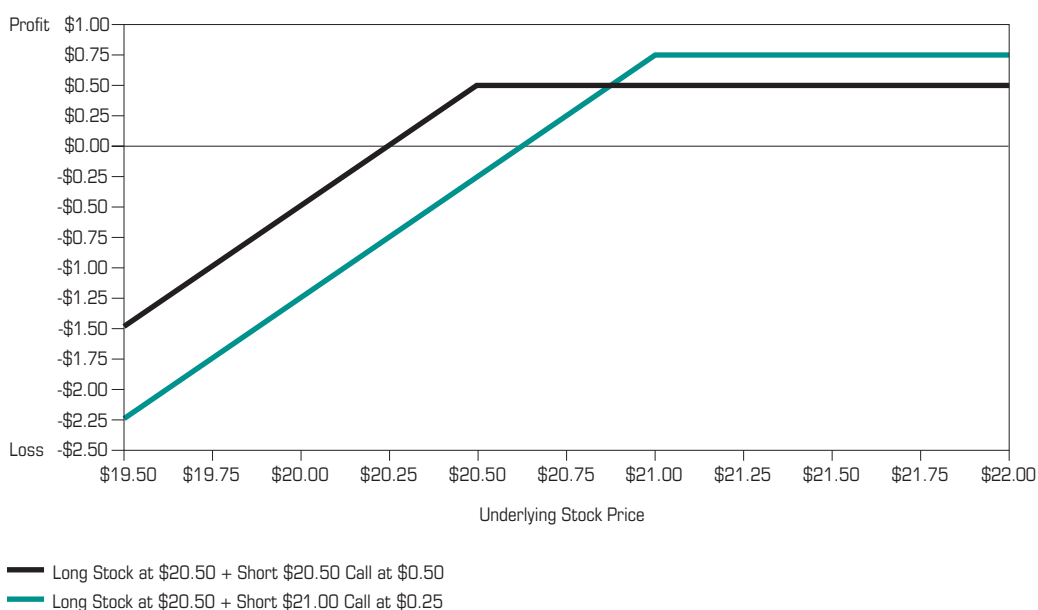
Equity options can be exercised at any time prior to expiry. As a result, you must be prepared to lose the stock at the strike price at any time, including before the stock goes ex-dividend.

If the share price unexpectedly strengthens, you may consider buying back the calls (possibly at a loss) and perhaps selling more call options at a higher strike price – rolling the position ('rolling up').

If expiry is approaching and you are concerned about unwanted exercise, you can buy back the calls (possibly at a loss) and perhaps sell more call options with a higher strike ('rolling up'), and/or a more distant expiry date ('rolling out') thereby avoiding exercise and potentially increasing the income flow.

If you hold your position to expiry in July, the profit/loss situation is shown on the graph below.

Profit/Loss at Expiry



Points to remember

- 1 Do not use the covered write if you are concerned about being exercised.
- 2 Be sure that you are content to sell your shares at the strike price if you are exercised.
- 3 Remember that the call option can be exercised at any time.
- 4 If the share price moves unexpectedly, be prepared to actively manage your position, perhaps by buying back the calls and selling more calls at a higher strike price ('rolling up') or at a more distant expiry date ('rolling out').

Main benefits of the options strategy

- 1 Generates income in flat and falling markets that enhances the yield of your stock holding and of your portfolio.

- 2 Provides limited cushioning in the case of a market fall.
- 3 If the option is exercised, the sale of your shares is achieved at a higher price than the share price at the time of writing the option.

Main risks of the options strategy

- 1 Share price falls dramatically, and the call option premium provides only limited cushioning. Note, however, that in the event of a fall in the share price you will always be better off having written call options than simply having held the long stock alone.
- 2 Share price rises significantly, and you miss out on the rise because your shares have been 'called away'. This is not a physical cost to you, but is an opportunity cost.

Characteristics of the options strategy

<i>Objective</i>	To earn income from the sale of the call options and thereby enhance the yield of your stock holding and of your portfolio.
<i>Construction</i>	Write call options over stock that you already hold.
<i>Market view</i>	Neutral: from mildly bullish or bearish in the short-term to somewhat more bullish in the longer term. Since you are long this stock in your portfolio, there is an implicit positive view on the stock. Nevertheless, you are willing to relinquish upside potential beyond the sold call strike during the life of the option.
<i>Maximum profit</i>	The maximum profit accruing during the life of this strategy is the premium received from the sold calls, plus the difference between the market price of the stock at the time of writing the calls and the strike price of the sold calls.
<i>Maximum loss</i>	The maximum loss accruing during the life of this strategy is the market price of the stock at the time of writing the calls less the premium received from the sold calls.
<i>Time Decay</i>	Time decay works in favour of the sold call position.
<i>Volatility</i>	Increase in volatility works against the sold call position.
<i>Margins</i>	No, as long as the stock is lodged as collateral.

Creating a Substitute for Physical Stock

Options can be used to create a substitute for physical stock. This is discussed in Chapter 5 ('Substituting Call Options for Stock') where the objective is to obtain exposure to an upwards move in a share price, while simultaneously ensuring that your capital is protected. The strategy discussed in Chapter 5 is not intended to leverage your portfolio: the intention is merely to substitute call options for a long stock position.

However, it is also possible to create leverage in your portfolio by purchasing call options at a fraction of the cost of the stock price. The following case study looks at an instance of leverage.

Example

In mid March, your portfolio is half index weight in DDD stock, holding 1 million shares.

Currently, you do not have enough cash to increase your weighting, but you are concerned that recent events will cause the price of DDD to rise in the short-term.

Because you are short of cash you can increase your exposure to DDD, while also limiting your downside exposure, by buying call options. Since you believe that the risk of an upside movement is only short-term, you intend to trade the calls before expiry. You also want to gain the full exposure of an index weight to DDD over the short-term.

The current market price of DDD is \$30.00. June at-the-money calls are trading at \$1.00.

The number of call options to purchase is calculated as follows:

- Required number of call options
- Required number of shares
 - Call option delta (x 1000)
 - 1,000,000 / (0.50 x 1000)
 - 2000 call options

By purchasing 2000 DDD Dec \$30.00 call options, you will now gain (or lose) the same amount over the short-term that an additional holding of 1 million shares in DDD would produce.

The purchase of the call options has cost you \$2 million, as opposed to an outlay of \$30 million for the stock.

This position will require active management if the original intention of the transaction is to be met. Remember that the delta of the call options will change over time. This means that the required number of call options will have to be adjusted in order to maintain the hedge.

Unwinding your position

It is now mid May, and the anticipated short-term rise in DDD has occurred. The price of DDD is now \$31.00 and you feel that there will be no further price appreciation. You decide to unwind your position.

The delta of the call options is now 0.6 and so, in order to maintain the correct hedge ratio, you have already sold some of your options at profit. Your average price on the 333 calls you have already sold is \$1.29. You have 1667 call options remaining, which are currently trading at \$1.54. You decide to sell the remainder of your calls.

Sold 333 DDD June 30.00 Calls @ \$1.29 (average)

Sold 1667 DDD June 30.00 Calls @ \$1.54 (average)

Your net profit on the transaction is \$996,750 which is approximately the same amount you would have made if you had bought 1 million shares in DDD and held them while the market rose \$1.00. For simplicity, transaction costs have not been included.

Variant

Another approach to is to buy call options that are significantly in-the-money, say around 10% in-the-money. If you buy one call option for each 1000 shares you want to acquire, the purchase of the calls can be treated as an alternative to buying the stock.

By buying calls instead of the shares, you are effectively paying slightly more than the market price of the shares. This extra amount paid is time value, and reflects the in-built protection of your position because you have only a small amount of cash at risk: recall that a long call position is equivalent to long stock plus a long put¹⁸. In addition to the value of this protection, the extra amount paid reflects the interest that can be earned on the cash residual during the life of the option.

Due to accelerated time decay as the options near expiry, there will be an optimal time to sell the options and switch into either longer dated calls, or the physical shares. This will depend, in part, on your stock view, and your attitude to dividends.

Points to remember

- 1 This strategy, which essentially substitutes options for the underlying stock, will be especially beneficial during times when options volatilities are low (options premiums are cheap).
- 2 If you own a replicated options portfolio instead of the underlying stocks, you do not receive any dividend payments, but you do not have the costs of holding the stock.

Main benefits of the options strategy

- 1 Maintains exposure to a rise in the share price.
- 2 Limits losses in the event of a fall in the share price.

Main risks of the options strategy

- 1 The maximum risk of the options strategy is the premium paid for the calls, less the interest income received (on the difference between the notional acquisition price of stock equivalents and the premium paid), plus the value of foregone dividends.
- 2 Profits in the event of a share price rise will be lower than if you hold the shares directly (due to premium paid).

Characteristics of the options strategy

<i>Objective</i>	To obtain exposure to an upward move in a share price, while simultaneously ensuring that your capital is protected.
<i>Construction</i>	Buy call options as an alternative to buying shares.
<i>Market view</i>	Bullish on the stock, but risk averse.
<i>Maximum profit</i>	Unlimited.
<i>Maximum loss</i>	The maximum loss of the options strategy is the premium of the call options less the interest income received plus the value of foregone dividends.
<i>Time Decay</i>	Time decay works against the bought calls.
<i>Volatility</i>	An increase in volatility works in favour of the bought calls.
<i>Margins</i>	No.

Questions and Exercises

- 1 Which of the following statements is true:
 - a) index options and standard equity options are both American style
 - b) index options and standard equity options are both European style
 - c) index options are European style and standard equity options are American style
 - d) index options are American style and standard equity options are European style.

- 2 Which of the following statements is true:
 - a) index options and equity options are both deliverable
 - b) index options and equity options are both cash settled
 - c) index options are deliverable and equity options are cash settled
 - d) index options are cash settled and equity options are deliverable.

- 3 The dollar value of a 1 point move in an option on the S&P/ASX 200 Index is which of the following?
 - a) \$1
 - b) \$10
 - c) \$25
 - d) \$100.

- 4 In respect of standard equity options, which of the following statements is true:
 - a) you can either sell or exercise an option at any time prior to expiry
 - b) you can neither sell nor exercise an option prior to expiry
 - c) you can exercise an option prior to expiry, but you can't sell it prior to expiry
 - d) you can sell an option prior to expiry, but you can't exercise it prior to expiry.

- 5 If you write standard calls against your stock and if, by expiry of the options, the share price has fallen, what action is required to exit your options position:
 - a) buy back your calls
 - b) exercise your calls
 - c) no action required
 - d) none of the above.

- 6 What is the difference between 'rolling up' and 'rolling out'?
 - a) 'rolling up' and 'rolling out' mean the same thing
 - b) 'rolling up' means rolling to a more distant expiry month, while 'rolling out' means rolling to a higher strike price
 - c) 'rolling up' means rolling to a higher strike price, while 'rolling out' means rolling to a more distant expiry month
 - d) none of the above.

- 7 If the delta of a call option is 0.5, the option is most likely to be which of the following:
 - a) at-the-money
 - b) in-the-money
 - c) out-of-the-money.

10. Answers to Questions and Exercises

Chapter 2: Answers

- 1 The Derivatives Liquidity Ratio, or 'DLR', is a measure of options volume in share equivalent terms and is defined as is the ratio of options traded to shares traded.
- 2 Open interest is an indicator of liquidity. It measures the number of contracts that have been opened in the market and not extinguished by an equal and opposite trade.
- 3 The three means that brokers can use to find 'large size' liquidity on behalf of clients are:
 - i Find matching clients with a 'natural' order.
 - ii Facilitate through filling the client's order by taking the other side of the order as principal, then managing that exposure by running a proprietary trading book.
 - iii Ask market makers how much liquidity they are prepared to supply.
- 4 The three sources of liquidity supply are:
 - i Market Making – professional firms that strive to make money from the bid ask spread or arbitrage.
 - ii Facilitation – where a broker 'facilitates' the execution of an order by taking the opposite side to the client as principal. The broker would usually hold this trade in their house account or proprietary trading arm until the position is closed out on market.
 - iii Crossing – where a 'natural' and matching client order is located on the opposite side of the transaction.
- 5 Three ways that market makers aim to make profits are:
 - i Make money from the bid ask spread.
 - ii Make money from options that are under or over priced (relative to perceived theoretical fair value).
 - iii Take a directional view of future volatility.
- 6 Usually, a market maker will immediately, within seconds, seek to hedge an exposure created from the sale or purchase of any option.

- 7 Four different types of market makers are:
 - i Delta hedgers.
 - ii Global exposure managers.
 - iii Trading desks.
 - iv Independent market makers.

Chapter 3: Answers

- 1 'Covered call' means that the option seller owns stock and sells a call that is 'covered' by that stock. The option seller lodges the stock as collateral with ACH to cover the possible exercise of the option as long as the option position is open. This ensures that this stock is available should the option be exercised.
- 2 'Buy write' is a type of covered call where the purchase of stock is executed simultaneously to the writing of call options. This is a distinct strategy where the purchase of the stock and the sale of the call options are executed as a coupled pair because the investor is seeking a particular risk-return profile.
- 3 When you sell (or 'write') a covered call, you receive the option premium. You can consider the option premium as a form of extra income earned from owning those shares. In effect, your shares are 'working harder' while you hold them.
- 4 If the share price at expiry is below the strike price of the option, the option will expire worthless, and you will have received the premium income at no cost. If the share price at expiry is above the strike price of the option, the option will be exercised and you will have to deliver your shares in return for receiving the strike price. A stock option can also be exercised ahead of expiry. In the case of call options, this is most likely to happen when the underlying stock is about to go ex-dividend.
- 5 In comparison to the long stock position, the writing of covered calls effectively gives up exposure to the share's upside beyond the strike price. In return, the option writer receives premium income which enhances the yield of the portfolio and provides a limited cushion if the share price declines.

- 6 i Selling covered calls generates extra income during periods when you expect the market will be flat or falling.
- ii Selling covered calls provides limited cushioning against weakness in the share price because the option premium you receive helps to offset any stock losses.
- iii Selling covered calls sets a possible exit price for your stock holding. You receive the premium now, and sell your stock later if the share price is above the strike price at expiry.
- 7 Around half the time value of a nine-month option will be lost in the last three months. Around half the time value of a three-month option will be lost in the last month.
- 8 As a seller of options, time decay works in your favour because the value of the option, for which you have received the premium, decreases with time. So, other things being equal, you would prefer to sell shorter dated options in order to take advantage of the accelerated rate of time decay.
- 9 All other things being equal, the lower the strike price, the higher the call option premium received. However, this also means that your upside exposure is capped at a lower level. Therefore a balance must be reached between risk and return.
- 10 Typically, out-of-the-money options are of most interest to covered call writers. Usually, you will be able to sell out-of-the-money call options in an attempt to enhance the yield of your portfolio, with the reasonable expectation that the calls will not be exercised.
- 11 In general, covered call selling can enhance the yield of your portfolio in most circumstances. The exception is when there is a strong and sustained rise in the stock that carries the share price above the strike price at expiry.
- 12 If the share price rises above the strike price, the worst that can happen is that the stock is called away. Since the sold calls are 'covered' through ownership of the stock, there is no physical upside risk in selling calls. The only upside risk is the opportunity cost of having your stock called away when you might prefer to keep it.
- 13 An unexpected drop in the share price can result in large losses. However, in the event of a fall in the share price you will always be better off having written calls than simply having held the shares alone. This is because the call premiums received as income provide a cushioning effect against the drop in the share price.
- 14 When you are concerned about a possible fall in the price of a share you hold, you can protect the capital value of your stock holding by the purchase of put options.
- 15 You would usually consider purchasing protection if you are concerned about a fall in the value of a stock in the short-term. These occasions will generally be event-driven short-term periods when there is some doubt as to whether the stock will clear the next hurdle unscathed.
- 16 Equity options have the potential to reduce market impact costs of acquiring stock by accumulating exposure via options. By acquiring exposure to a stock via the purchase of call options on the options market, you are not generating direct market impact pressure in the underlying share market.
- 17 The objective of the stock repair strategy is to allow you to break-even more quickly on a losing stock position.
- 18 The stock repair strategy costs nothing to implement, and does not increase the risk of your position.

Chapter 4: Answers

- 1 c) selling out-of-the-money puts.
- 2 The main advantage of the option strategy over the limit order physical strategy is that, due to receipt of premium income, the market does not need to trade as low in order for you to effectively achieve your target entry price. Also, if the share price does not fall, you still benefit from receipt of the option premium.
- 3 The main risk is that the share price falls significantly. In this case, you may choose to unwind your position at a loss by buying back the put option. Or, you may choose to hold the put option to expiry and therefore be obliged to buy the stock at the strike price, which by then could be well above the market price.
- 4 c) selling out-of-the-money calls.
- 5 The main advantage of the option strategy over the limit order physical strategy is that, due to receipt of premium income, the market does not need to trade as high in order for you to effectively achieve your target exit price. Another advantage is the receipt of premium if the share price stays flat or falls.
- 6 Because the calls that you have written are covered by your stock holding, you are not exposed to physical risk on the upside. The worst that can happen on the upside is that your stock is called away at the strike price leaving you with a profit. However, there is always the opportunity cost of missing out on capital appreciation above the strike price.
- 7 b) Buying out-of-the-money puts and selling out-of-the-money calls.
- 8 The advantage of the collar over the protective put alone is a reduction in costs, since the premium received from the sold call 'cross subsidises' the cost of the bought put.
- 9 The main risk of the collar strategy is the opportunity cost if the stock price moves above strike price of the sold call.

Chapter 5: Answers

- 1 The objective of the '90/10 Strategy' is to obtain exposure to an upwards move in a share price, while simultaneously ensuring that your capital is protected. This strategy is not intended to leverage your portfolio. The intention is merely to substitute call options for a long stock position.
- 2 The 90/10 strategy is appropriate when you are bullish on a stock, but risk averse.
- 3 The two main benefits of the 90/10 strategy are that it maintains exposure to a rise in the share price, and it limits losses in the event of a share price fall.
- 4 The maximum loss of the 90/10 strategy is the premium paid for the calls minus the interest income received from the cash-equivalent investment.
- 5 The maximum profit of the 90/10 strategy is unlimited.
- 6 The objective of the bull call spread is to obtain low cost exposure to an expected modest rise in the share price.
- 7 The bull call spread is appropriate when you have a moderately bullish view on the stock (not extremely bullish).
- 8 a) buy a call option with a lower strike price and sell a call option with a higher strike price.
- 9 The maximum loss of the bull call spread strategy is the cost of the spread (ie. the price of the bought option minus the income received from the sold option).
- 10 The maximum profit of the bull call spread strategy is the difference between the strike prices minus the cost of the spread.

Chapter 6: Answers

- 1 Using options to tilt your portfolio away from index is able to add more value from your research because you can underweight a stock (that is identified as a strong sell) by more than its weight in the index. If you simply create overweights and underweights in your physical stock holdings, you can never underweight a stock by more than its weight in the index.
- 2 Another advantage of using an options strategy to implement portfolio tilts is that it can be treated as an overlay to an underlying physical portfolio that continues to mimic the benchmark index.
- 3 If all of the sold calls are covered by your long stock you will not need to pay margins, as long as the underlying stock is lodged as collateral. If you sell calls in order to underweight a stock by more than its index weight, then you will need to pay margins on the extra amount.
- 4 You can use options to enhance the return on the stocks in your index portfolio by raising premium income by selling puts and calls on those stocks that you think are fairly priced and are likely to remain at current levels during the life of the option.
- 5 d) sell a call option with a strike price higher than the current stock price, and sell a put option with a strike price lower than the current stock price.
- 6 Time decay works in favour of the sold strangle.

Chapter 7: Answers

- 1 d) long stock plus long put.
- 2 a) in-the-money put.
- 3 a) in-the-money put.
- 4 b) a long at-the-money call plus a long at-the-money put with the same expiry dates.
- 5 d) time decay and a decrease in volatility both work against the long straddle.
- 6 b) an option has a greater proportionate rate of return and a lesser absolute return than the underlying share.
- 7 c) at-the-money.

Chapter 8: Answers

- 1 c) index options are European style and equity options are American style.
- 2 d) index options are cash settled and equity options are deliverable.
- 3 b) \$10.
- 4 a) you can either sell or exercise your option at any time prior to expiry.
- 5 c) no action required.
- 6 c) 'rolling up' means rolling to a higher strike price, while 'rolling out' means rolling to a more distant month.
- 7 a) at-the-money.

11. Further Recommended Reading

Option Volatility and Pricing – advanced trading strategies and techniques

by Sheldon Natenberg

This book covers all aspects of options, including pricing models, volatility considerations, basic and advanced trading strategies and risk management techniques. Natenberg provides a down-to-earth explanation of the key concepts essential to successful trading in a way that does not rely heavily on complicated mathematics. Among options users in the USA, this book is considered to be the definitive work in the field.

Options, Futures, and Other Derivatives

by John C. Hull

This text book looks at how academia and real-world options practice have an area of common overlap in respect of theory and practice, and provides a theoretical underpinning to the valuation of all derivatives. Hull's treatment has a strong focus on mathematics and requires prior knowledge in the areas of finance, probability and statistics.

Equity Options – valuation, trading and practical strategies

by Hugh Denning

This is a practical reference for fund managers explaining various useful options strategies for managing an equities portfolio. In particular, Denning explores a number of trading techniques from the perspective of equity managers who use options to outperform those who do not use options. Denning outlines ways in which outperformance can be achieved through the use of options by establishing a superior risk-return profile given a certain cash allocation to equities.

Option Pricing and Investment Strategies

by Richard Bookstaber

Bookstaber provides an introduction to the intuitive and quantitative aspects of option pricing and trading without relying on advanced mathematical arguments. The book discusses various strategies in option trading and exposure management.