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AN INTRODUCTION TO CAPITAL PROTECTION STRATEGIES

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UNE INTRODUCTION AUX STRATEGIES DE PROTECTION DU CAPITAL

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RESUME

Le développement rapide des instruments dérivés au cours de la dernière décennie a permis aux investisseurs d'élaborer des stratégies, auparavant impossibles. Les plus controversées de ces stratégies sont, sans nul doute, celles qui visent à protéger le capital de l'investisseur contre la dépréciation - généralement connues comme strategies d'amélioration du rendement d'un portefeuille ou "d'assurance portefeuille".

Au début de l'année 1987, ces stratégies étaient hautement appréciées, et considérées comme une solution d'avenir pour les investissements des caisses de retraite, notamment aux Etats - Unis, où une nouvelle réglementation comptable venait d'entrer en vigueur ; à la fin de la même année, elles étaient, dans certains milieux, considérées comme responsables du krach d'octobre.

Le présent article traite d'abord des attraits des stratégies de protection du capital. On observe qu'au cours des sept dernières années, les titres britanniques ont enregistré des performances supérieures de 6% par an à celles des valeurs au comptant et des fonds d'Etat. La plupart des investisseurs s'attendent à ce que ces titres dépassent dans l'avenir les autres types de placements. Il est donc comprehensible que les investisseurs souhaitent affecter aux titres un pourcentage aussi élevé que le permet leur tolérance de risque. Toutefois, beaucoup d'investisseurs ont un plancher - un rendement minimum à réalisé ou une valeur minimum en - dessous de laquelle la valeur de leurs actifs ne doit pas descendre. C'est pour ces investisseurs que les stratégies de protection du capital présentent de l'intérêt.

Les stratégies de protection de capital permettent aux investisseurs de tolérer un plus grand risque pour leurs avoirs en capitaux. Elles sont le plus appropriées pour les organisations ayant des engagements à court terme ou pour les investisseurs ayant des objectifs d'investissement à court terme. On examine dans cet article les principaux types de stratégies de protection du capital en usage, à savoir les stratégies d'options et les strategies d'optimisation du rendement par wuverture dynamique. Il existe deux principaux types de stratkgies d'options : dans le premier type de stratégie, connu comme méthode 90 - 10, l'investisseur détient des valeurs au comptant et achète des options d'achat ; dans l'autre type de stratégie, l'investisseur détient des actions et réalise la couverture de son portefeuille par des options de vente. Les stratégies d'optimisation par couverture dynamique nécessitent un ajustement systématique par l'investisseur des proportions de valeurs au comptant et de titres, selon une formule prédéterminée. La formule est conçue en sorte d'assurer que lorsque la valeur du fonds atteint le plancher, celui - ci est investi à 100% en valeurs au comptant. On examine les avantages et inconvénients des différentes méthodes et on analyse le rendement d'une stratégie de couverture dynamique, par un procédé de modélisation stochastique.

L'article explique que les stratégies de protection du capital n'améliorent pas le rapport traditionnel rentabilité / risque : elles remplacent simplement une répartition de la rentabilité, par une autre, répondant aux préférences des investisseurs en matière de risque.

BY A.J. PERRINS FIA

ABBEY LIFE INVESTMENT SERVICES

RESUME

The rapid growth of derivative instruments over the last decade has enabled investors to develop strategies which were not possible before. Undoubtedly the most controversial of these are strategies which aim to protect an investor's capital against loss of value - commonly known as portfolio insurance strategies.

Early in 1987 these strategies were being acclaimed as the way forward for pension fund investment, particularly in the US where new accounting regulations had come into force. Later that same year they were in some quarters being blamed for the October crash.

This paper looks firstly at the attractions of capital protection strategies. It observes that, over the last seventy years, UK equities have outperformed both cash and gilts by over 6% p. a. Most investors expect equities to outperform other asset types in the future. It is therefore understandable that investors should wish to commit as large a percentage to equities as their risk tolerance allows. However, many investors have a bottom line - a minimum return which must be achieved or a minimum value below which the value of their assets must not fall. It is to these investors that capital protection strategies appeal.

Capital protection strategies permit investors to gain greater exposure to equity assets than they could tolerate without such strategies. They are most appropriate to organisations with short term liabilities or to investors with short term investment objectives.

The paper examines the main types of capital protection strategies in use, namely options strategies and dynamic hedging strategies. There are two main types of options strategy : one known as the 90 : 10 method, where the investor holds cash and buys call options, and the other where the investor holds stocks and hedges the portfolio using put options. Dynamic hedging strategies require the investor to systematically adjust the proportions held in cash and equities, according to a pre - determined formula. The formula is devised so as to ensure that, by the time the fund value reaches the floor, the fund will be 100% invested in cash. The advantages and disadvantages of the different methods are considered, and the returns from a dynamic hedging strategy are examined by a process of stochastic modelling.

The paper explains that capital protection strategies do not improve the traditional risk/return comparison. Instead they substitute one return distribution for another so as to suit the investors risk preference.

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1 - INTRODUCTION

The rapid growth of derivative instruments over the last decade has enabled investors to develop strategies which were not possible before. Undoubtedly the most controversial of these are strategies which aim to protect an investor's capital against loss of value - commonly known as portfolio insurance strategies.

Early in 1987 these strategies were being acclaimed as the way forward for pension fund investment, particularly in the US where new accounting regulations had come into force. Later that same year they were in some quarters being blamed for the October crash.

This paper looks at the two main types of capital protection strategy - how they work and the pros and cons of each, but fustly... why have these strategies become popular ?

1.1 THE ATTRACTION OF CAPITAL PROTECTION STRATEGIES

Over the last seventy years UK equities have outperformed both cash and gills by over 6% p.a. Most investors expect equities to outperform other asset types in the future. It is therefore understandable that investors should wish to commit as large a percentage to equities as their risk tolerance allows.

But what is risk tolerance ? How is it expressed ? In the real world there are many investors whose attitudes to risk cannot be defined in the traditional way - in terms of the variability of expected returns. They have a bottom line - a minimum return which must be achieved. It is to these investors that capital protection strategies appeal.

Capital protection strategies permit investors to gain greater exposure to equity assets than they could tolerate without such strategies. They are most appropriate to organisations with short term liabilities or to investors with short term investment objectives.

An organisation with long term liabilities, such as a UK final salary pension scheme, can tolerate far greater investment risk. A growing fund can meet its current obligations out of its regular income, and has no need to realise assets at their current market value. Short term fluctuations in equity values are therefore of little concern. A large part of the fund can be invested in equities, and portfolio protection is unlikely to be necessary.

This is not so, however, in the United States where the view formed of a pension fund's solvency can be heavily dependent on market values. In 1987 new accounting regulations (FASB 87) came into force. The effect of these was to show changes on the surplus of the fund in the corporate balance sheet and income statement[2]. It was this legislation that was responsible for the huge growth in popularity of "portfolio insurance" in America in 1987, and by October it is estimated that $ 60bn - $90bn of US funds were managed in this way.

2 - OPTIONS STRATEGIES

There are two main approaches which fall under this heading, one using call options (commonly known as the 90 : 10 method), the other using put options. The way in which they work is explained below.

2.1 THE 90 : 10 METHOD

Consider an investor with £100 m who requires at least the return of his capital after one year, but wishes to participate in equity gains over the period. If one year money is earning just over 11% he can guarantee the return of his capital by putting £90 m on deposit at this rate. The other £10 m is invested in call options to capture equity market returns. This is where the term 90 : 10 comes from.

In practice the interest rate will be different and the investor's time horizon may be more or less than one year. The percentage invested in cash or bonds will be fixed accordingly so as to ensure that the minimum acceptable return is achieved.

2.2 HEDGING WITH PUT OPTIONS

An alternative to holding cash and call options is to hold stocks and put options. Consider the investor with £100 m who requires at least the return of his capital after one year. He buys a one year stock index put option, with an exercise price equal to the current market level. If this costs 4%, he can invest £%m in the stocks constituting the index.

The put option protects the portfolio from falling in value below £%m while dividend income brings the value back up to its original £100 m. If the stocks rise in value, the investor captures 96% of stock market gains, but obviously loses the original £4 m invested in options.

2.3 GRAPHICAL REPRESENTATION

Consider a portfolio, value 100, current market level 100.

Let x be the market return excluding dividends.

d be dividends receivable at the end of the year.

i be the riskless rate of return.

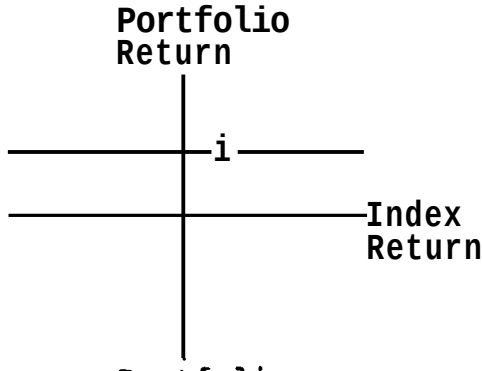
c be the premium required to buy a call option, strike price 100, giving a return of x - c.

y be the return from a portfolio of 100.

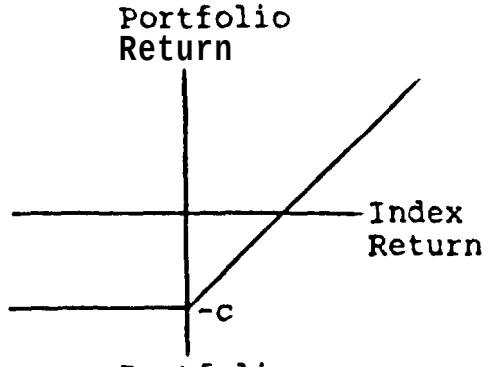
90 : 10 Method

For cash,	$y = i$	
For a call option,	$y = -c$	if $x < 0$
	$y = x - c$	if $x > 0$
For the 90 : 10 method	$y = 0{,}9\,i - 10$	if $x < 0$
	$y = 0{,}9\,i - 10 + 10\,x/c$	if $x > 0$

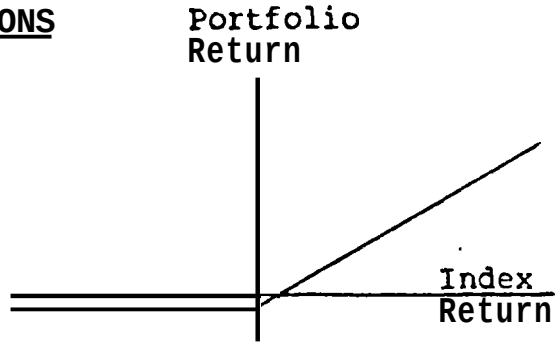
CASH



CALL OPTIONS



CASH & CALL OPTIONS



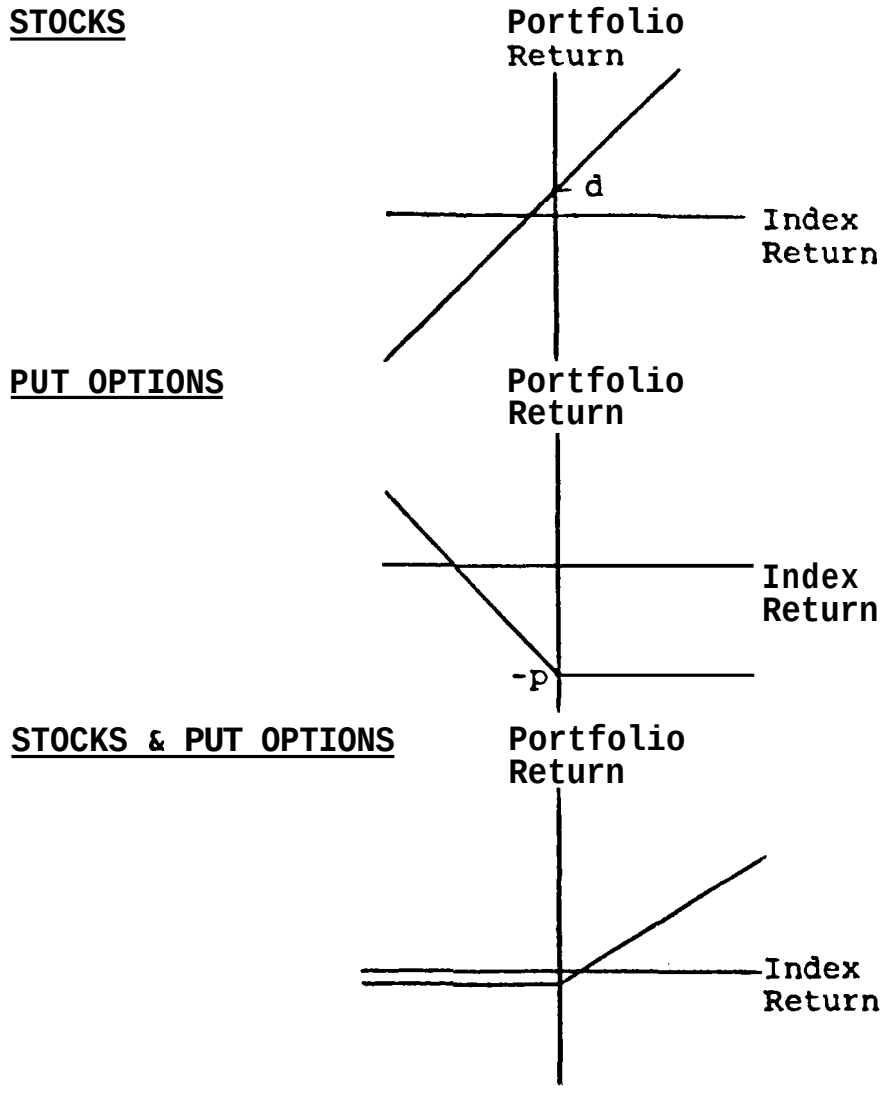
Hedging with Put Options

Let p be the premium required to buy put options,
strike price 100, sufficient to protect a portfolio of size (100-p).

For a fully invested portfolio $y = x + d$

For a put option $y = -x - p$ if $x < 0$
$y = -p$ if $x > 0$

For the protected portfolio $y = (100 - p)(100 + d)/100 - 100$ if $x < 0$
$y = (100 - p)(100 + x + d)/100 - 100$ if $x > 0$



2.4 ADVANTAGES OF OPTIONS STRATEGIES

Guaranteed Minimum Returns

The main advantage of options strategies is the certainty that the portfolio value will not fall below a certain level - we will see later that the dynamic hedging method offers only a strong probability that this will be achieved, but options strategies can guarantee the minimum return, because the risk is underwritten by the writer of the option (with an index put strategy, the guarantee holds only if the stocks do not underperform the index).

Predictability of Returns

The final value of the portfolio depends only on the final value of the index. This contrasts with the dynamic hedging approach, where the return depends on how the index moved during the period.

Ease of Day - To - Day Management

Once an option strategy has been put in place and the options purchased, the manager can sit back and await the results. Further activity is only necessary to manage cashflows or if options expire.

2 - 5 DISADVANTAGES OF OPTIONS STRATEGIES

Length of Options

The most serious drawback is that the life of options is not generally long enough to satisfy the needs of these strategies. If the time horizon of the investor is one year or over, he will generally need to purchase more than one series of options in order to effect his strategy. This presents two problems ;

Firstly, it makes strategies more expensive than they need otherwise be, because more protection is being purchased than is necessary, and more is being paid in way of commission and spreads. Secondly, the terms on which further options can be purchased is unknown, which means that protection may be more expensive than was originally expected.

It may be possible to overcome these problems by buying over-the-counter (OTC) options or warrants. These are often available for a one -, two - or three - year time horizon and can be designed so as to meet precisely the client's needs.

Tracking Error

A strategy of holding stocks and stock index put options will only achieve the expected returns if the stocks held perform in line with the index. In particular, if the market suffers a large fall and the stocks held underperform the index, then the floor return will not be achieved. This risk can be minimised by controlling the tracking error of stocks held compared to the index or by buying individual stock options instead of index options. However, individual stock options will generally be more expensive, because (a) expiry dates are shorter and (b) volatilities are larger.

2 - 6 EXPECTED RETURNS

One advantage of options strategies already mentioned is that returns arc not path-dependent. For any given market return, the expected return from an option strategy can be calculated in advance.

F a example, consider an investor with £100 m in FTSE stocks. He buys £5.5 m of FTSE put options, with an exercise price equal to 100% of the current index level and a premium of 5.5%. This puts a floor of £100 m on the stocks held, in addition to the fA.4m he expects

to receive in dividend payments (assumed for simplicity to be received at the end of the year). He thus establishes a 99% floor (£104.4 m on his initial investment of £105.5 m).

The returns and 'upside capture' expected for various levels of equity market return are shown below. 'Upside capture' is defined as the return from a protected portfolio as a percentage of the return from a fully invested portfolio.

Total FTSE Return	Final Value of Portfolio £m	Return on Portfolio	Upside Capture
-20%	104.4	-1.0%	N/A
-10%	104.4	-1.0%	N/A
0%	104.4	-1.0%	Negative
5%	105.0	-0.5%	Negative
10%	110.0	4.3%	43%
15%	115.0	9.0%	60%
20%	120.0	13.7%	69%
30%	130.0	23.2%	77%
40%	140.0	32.7%	82%

3 - DYNAMIC HEDGING

3 - 1 ORIGINS

When Professor Hayne Leland from the University of Berkeley, California took his sabattical in 1977, it was suggested to him that it would be of real economic value to society if he could find a way of insuring against stock market losses. His answer was to develop a strategy of systematically buying and selling stock known as dynamic hedging - a strategy which because so popular that by October 1987 an estimated $60 - $90bn of equity assets were managed in his way.

3 - 2 THE PRINCIPLES OF DYNAMIC HEDGING

The starting point is to decide on a 'floor' - the minimum acceptable value for the portfolio. At any time the difference between the actual value of the portfolio and the floor is known as the cushion.

The portfolio itself is split into two parts - risky assets (usually equities) and safe assets (usually cash an deposit or short - dated fixed interest securities). The percentage held in risky assets is known as the exposure. As the fund value increases, the cushion increases, giving greater freedom to invest in risky assets (i.e. increasing the exposure). As the fund value falls the cushion decreases, and the exposure has to be reduced until as the cushion approaches zero the exposure approaches zero. In other words by the time the fund value reaches the floor the fund is 100% invested in safe assets.

Some forms of dynamic hedging use complex mathematical models to determine the asset mix, calculating the exposure to replicate synthetically the behaviour of a put option.

This makes dynamic hedging more complicated than it needs to be. It is more common for the exposure to be determined from a simple formula of the form :

e = mc

e = exposure (amount in the risky asset)

c = cushion (fund value minus floor)

m = multiple (controls the sensitivity)

Dynamic hedging using a formula of this type is known as "Constant Proportion Portfolio Insurance" (CPPI).

3 - 3 PRACTICAL APPLICATION

'Tolerance'

In practice market values will fluctuate, and the cushion and target exposure will vary. It would clearly be very expensive to constantly rebalance the portfolio to achieve target exposure, as the fund would be subject to a 'whipsaw' effect of buying high and selling low. It is far wiser to only rebalance at a certain 'trigger' point, either when the market has moved by a certain amount since the last rebalance, or when the actual exposure differs from the target exposure by more than a specified amount. The degree by which the market moves or the exposure diverges from target before triggering a trade is known as the 'tolerance'.

Multiple

The choice of multiple determines the degree of risk taken. A small multiple gives a low exposure to equities, and a very small chance that the fund value will ever reach the floor. A larger multiple gives a higher exposure to equities, but increases the the chance that the fund value will fall through the floor.

For instance, consider an investor with a fund of 100, a floor of 95, and a multiple of 4. His cushion is 5 and he will invest his fund 20/80 equities / cash There is very little chance that his chosen floor will be threatened. If, however, he had chosen a multiple of 20 he would have invested 100 in equities. If the market suddenly fell by over 5% and he was unable to sell during the fall, his floor would be breached.

Stock Index Futures

In practice rebalancing will normally be carried out using stock index futures rather than the physical stocks, for reasons of speed and cost

By buying a stock index future the investor gains an immediate exposure to every stock in the index. The transaction is completed in seconds, removing the problem of deciding which individual stocks to buy and sell and saving the time (which can be of vital importance when sales are triggered) of dealing in those stocks. Furthermore the market impact of dealing in futures is likely to be less than dealing in the underlying stocks.

The transaction costs associated with dealing in futures are far smaller than dealing in the underlying stocks. A round - trip transaction (i.e. buying and selling) would

typically cost less than 0.2% in the future, compared to nearly 2% in the underlying stocks. When dealing in futures, there is a further cost which is not known at outset, and may be positive or negative, depending on whether the future is trading cheaply or expensively compared with its 'fair value'.

3-4 ADVANTAGES OF DYNAMIC HEDGING

Flexibility

The dynamic hedging method is very flexible. A change of strategy in mid-term (e.g. a change of floor or an increased multiple) can be accommodated immediately, simply by buying or selling the appropriate number of futures contracts. Furthermore the strategy can from outset be operated with a static or a moving floor. For instance consider these examples:-

a) An investor with 100 to invest wants to be able to stop the strategy at any time with the return of at least 90. In this case the floor is fixed at 90.

b) An investor with 100 to invest requires that at least 110 will be available at the end of three years.

In this case the floor is $110/(1+i)^{3-t/12}$ where:

t is time in months

i is the interest rate to the end of year 3.

In other words if the floor is reached before the end of the three years, the fund will be fully invested in cash, and will grow to 110 by the end of the period.

Hiier Expected Returns

An options strategy requires another party to underwrite the risk on the options purchased. A dynamic hedging strategy takes the risk of being unable to deal in sufficient size at the appropriate time in order to protect the floor. This should give higher expected returns because the fund is not paying the "certainty premium" that would be implicit in the price of an option.

Longer Time Horizons

Option strategies are limited by the non-availability of longer-dated options. Dynamic hedging allows the creation of strategies with longer time horizons than are feasible using options.

3-5 DISADVANTAGES OF DYNAMIC HEDGING

Risk of 'Failure'

There are two fundamental objections. Firstly, there is no guarantee that a dynamic strategy will protect the floor return. The fund is itself bearing the risk of a sharp decline in equity prices during which it is not possible to deal in the required size. This risk increases as the multiple (m) used in the formula increases, but the biggest danger is that the size of the equity market decline is itself exacerbated by the weight of money

following similar strategies. The Brady Report, commissioned after the October 1987 crash, estimated that dynamic hedging led to sales of $20bn - $30bn of shares between October 14th - October 20th and, additionally, short-term traders sold shares heavily in anticipation of dynamic hedging sales. It concluded that dynamic hedging was a major reason for the unprecedented speed with which markets fell.

The "Whipsaw" Effect

The second fundamental objection is that the dynamic hedging process involves buying after prices have risen and selling after prices have fallen. This would appear contrary to common sense, and if markets are volatile the strategy is subject to a "whipsaw effect" where the manager is obliged to sell stocks at a lower price than he bought them at, or buy at a higher price that he sold at. This clearly results in diminished returns.

Uncertainty

A lesser problem is that of uncertainty. The returns from a dynamic strategy are dependent not only on the returns from the safe and risky assets, but also the way in which the fund's exposure to those assets moves over the period and the pattern of market returns during the period. For example if the equity market rose steadily throughout the year to return gains of 40% a dynamic strategy would show a healthy return, but if the market initially fell sharply and then recovered strongly to return, 40% on the year as a whole, the dynamic strategy would show a poor return. This is because the initial fall leaves the fund with a low exposure to equities, and consequently only a small proportion of the fund benefits from the subsequent rise.

3-6 SIMULATING THE RETURNS FROM DYNAMIC HEDGING STRATEGIES

Many studies have used historical results to present expected returns from a dynamic hedging strategy. These studies serve an important role in showing the historical behaviour of protection strategies. However historical research is limited by the amount of historic data available, and does not allow the explaation of all possibilities in terms of the pattern of equity market returns. For this kind of information one has to turn to stochastic modelling.

To examine the returns from different dynamic hedging strategies one needs to make an assumption about the probability distribution of equity market returns. I have assumed that the shape of returns is best represented by the log-normal distribution. In practice markets may not follow this distribution, but the impact on mean returns is unlikely to be large.

THE FORMULA USED

The formula I have used in simulations is of the form:

$$e = mc - t$$

where t is the tolerance

e is the % of the current fund invested in equities

m is the multiple

c is the current fund value minus the floor, expressed as a % of the current fund value

Two features of the formula should be noted:

Firstly, the *cushion* has been expressed as a percentage of the current fund value. If the actual exposure is *equal* to mc, the cushion will not be eroded (the floor will not be breached) unless the market falls by over 100/m% and the manager is unable to deal in sufficient size during that fall. This is very helpful because it quantifies the risk of the protection failing.

Secondly, by defining the target exposure as e = mc - t we ensure that the actual exposure will never exceed mc. Hence the model can always withstand a rapid fall of 100/m%, even when the actual exposure is t % above the target exposure.

ASSUMPTIONS NEEDED

The return from a dynamic strategy is dependent on a number of factors, some within the control of the 'designer' of the strategy, some outside of his control. Assumptions are required for the following:

Factors within the Investor's Control

- Time horizon of the strategy.
- Degree of protection required (i.e. floor return).
- Multiple chosen in the formula.
- Tolerance permitted before rebalancing.

Factors outside of the Investor's Control

- Returns on safe asset (cash).
- Returns on risky asset (equity).
- Volatility/pattern of returns on equity.
- Transaction expenses / futures mis - pricing.

CENTRAL ASSUMPTIONS

The central assumptions used in the simulations are as follows:

Time horizon..... one year
Floor..... 100 % of initial fund value
Multiple..... 5
Tolerance..... 5%
Return on Safe Assets..... 10% p.a
Mean Return on Equity..... 15% p.a
Expected Volatility..... 18%
Rebalancing Costs..... 0.5%

Notes to Assumptions

1. The floor value must be available at the end of the time horizon. Hence after time t (in years) the floor is $100 / (1 + i)^{1-t}$ where i is the return on safe assets.

2. A multiple of 5 implies that the strategy is able to withstand a rapid equity market decline of 20%.
3. Tolerance of 5% means that the portfolio will be rebalanced when actual exposure diverges from target exposure by more than 5%.
4. Volatility is measured by the annualised standard deviation of equity market returns. The figure of 18% compares with volatility of 18-22%: experienced in the equity markets of UK, US and Japan over the last five years (or 14-18% if the fourth quarter of 1987 is excluded).
5. Rebalancing costs of 0.5% assume that rebalancing is carried out using futures. An allowance is included for adverse mis-pricing of the future relative to the index.

RESULTS

The table below shows the results of simulations following the central assumptions.

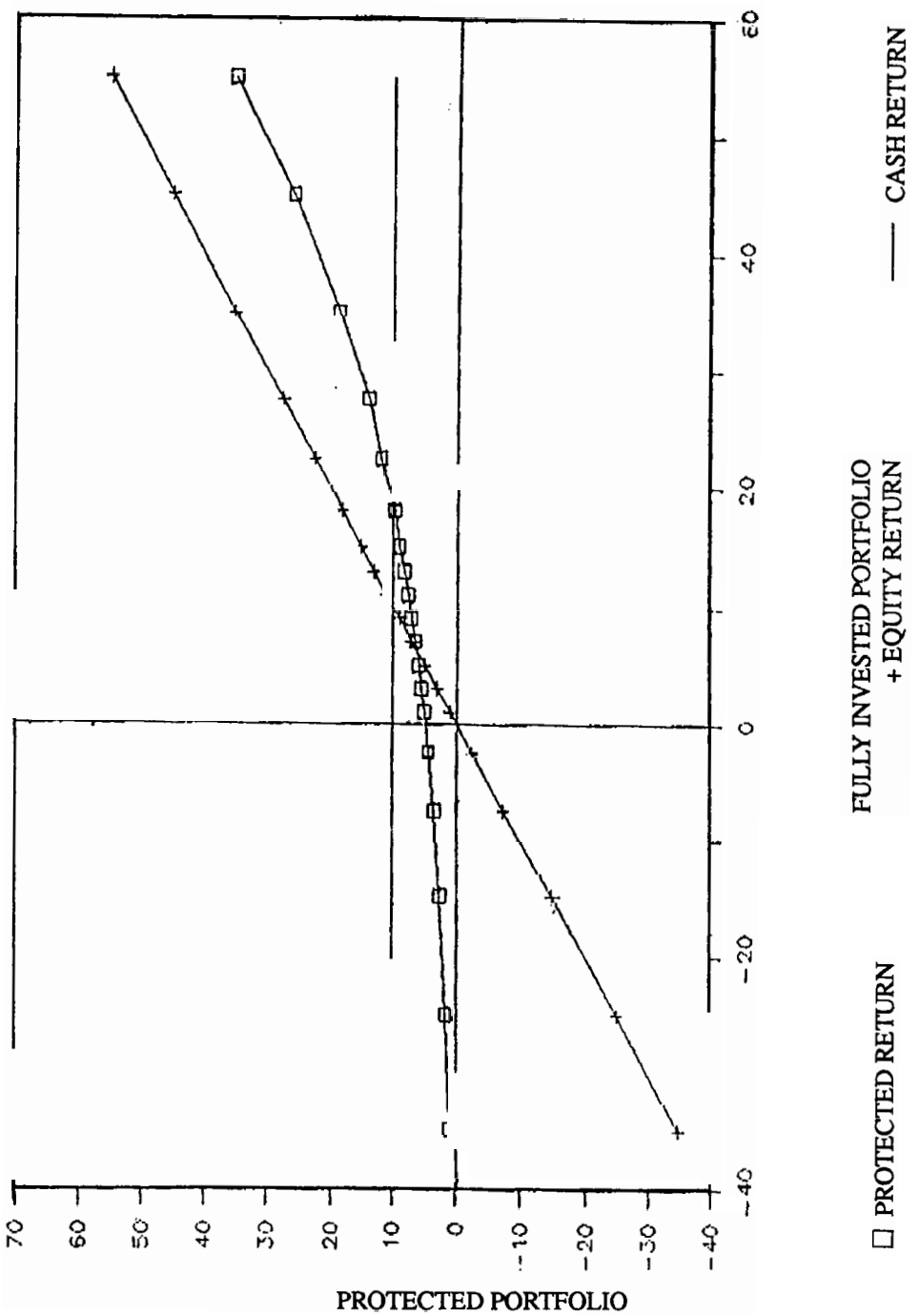
Equity Market Returns		Expected Return from Protected Portfolio	
Range	Probability	Mean Return	Upside Capture
<0%	20.6%	3.4%	N/A
0-2%	3.8%	5.0%	500%
2-4%	4.1%	5.6%	186%
4-6%	4.3%	5.8%	117%
6-8%	4.5%	6.4%	91%
8-10%	4.5%	7.1%	79%
10-12%	4.6%	7.5%	68%
12-14%	4.6%	8.1%	63%
14-16%	4.3%	9.0%	60%
16-20%	8.4%	9.7%	54%
20-30%	16.9%	12.9%	52%
30-40%	10.4%	18.7%	53%
40-50%	5.3%	25.8%	57%
>50%	3.7%	40.2%	67%
Mean Arithmetic Returns		10.9%	73%
Mean Geometric Returns		10.6%	71%

Central Assumptions

Expected Equity Return	= 15% p.a.	Multiple	= 5
Market Volatility	= 18% p.a.	Tolerance	= 5%
Riskless Rate	= 10% p.a.	Floor	= 100%

See Graph 1

1
DYNAMIC HEDGING ONE YEAR PERIOD



The Effect of Factors within the Investor's Control

The following tables show the effect of changing just one of the central assumptions.

Market Returns Range	Expected Upside Capture from protected Portfolio			
	Central Assumptions	Tolerance=2%	Floor=95%	Multiple=3
0-2%	500%	444%	200%	770%
2-4%	186%	167%	98%	270%
4-6%	117%	108%	71%	165%
6-8%	91%	84%	63%	123%
8-10%	79%	74%	59%	101%
10-12%	68%	65%	59%	88%
12-14%	63%	60%	58%	77%
14-16%	60%	57%	56%	70%
16-20%	54%	52%	56%	61%
20-30%	52%	50%	63%	52%
30-40%	53%	54%	74%	45%
40-50%	57%	60%	78%	41%
>50%	57%	70%	84%	40%
Mean Arithmetic Return	10.9%	10.7%	11.6%	10.9%
Mean Upside Capture	73%	71%	77%	73%
Mean Geometric Return	10.6%	10.3%	11.0%	10.8%
Mean Upside Capture	71%	69%	73%	72%

See Graph 2

The Effect of Factors outside of the Investor's Control

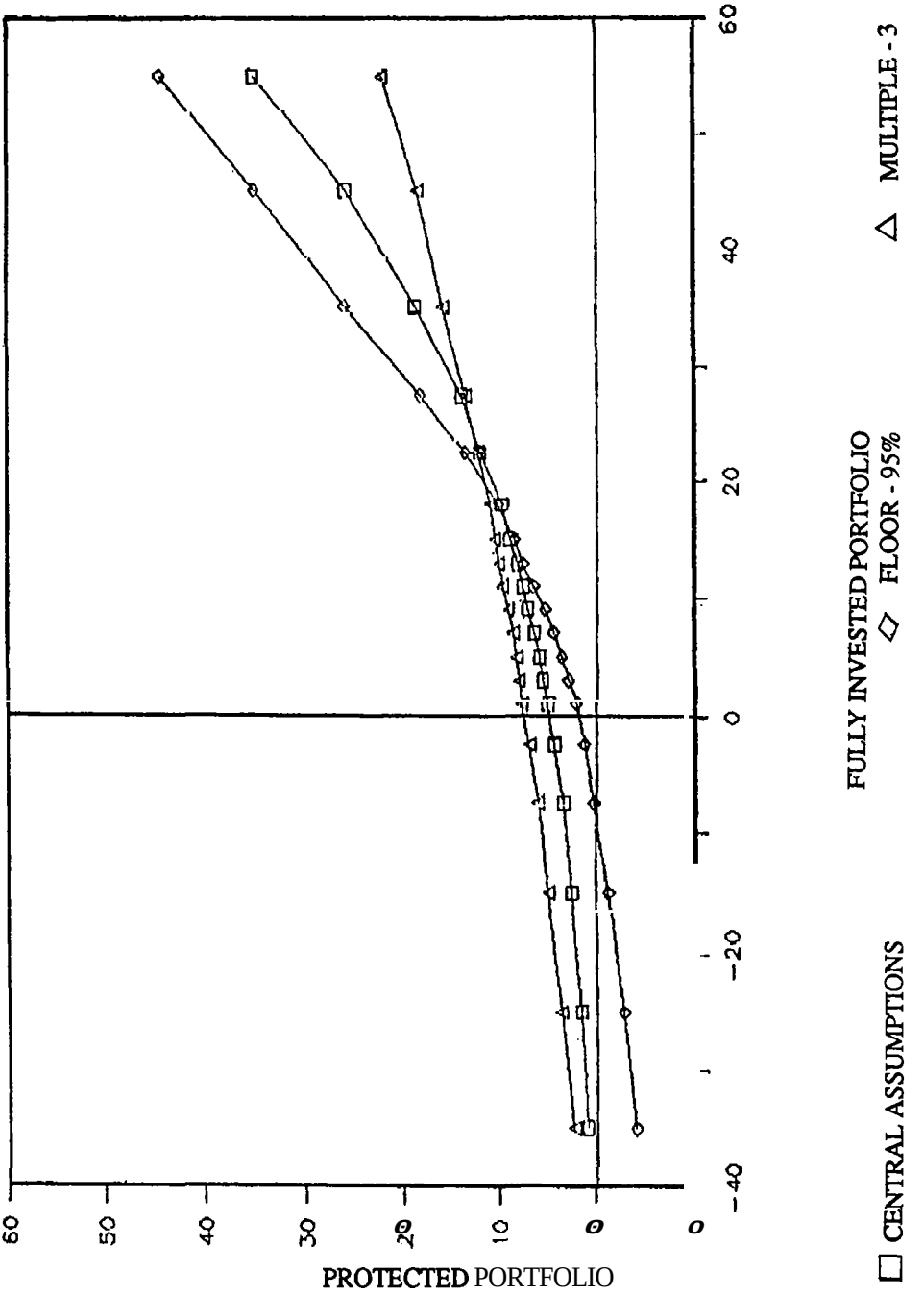
Market Returns Range	Expected Upside Capture from Protected Portfolio		
	Central Assumptions	Riskless Rate = 12%	Volatility = 25% p.a.
0-2%	500%	535%	385%
2-4%	186%	200%	133%
4-6%	117%	126%	88%
6-8%	91%	100%	70%
8-10%	79%	85%	58%
10-12%	68%	75%	51%
12-14%	63%	69%	49%
14-16%	60%	66%	46%
16-20%	54%	61%	38%
20-30%	52%	58%	40%
30-40%	53%	60%	41%
40-50%	57%	65%	48%
>50%	67%	74%	56%
Mean Arithmetic Return	10.9%	12.1%	8.6%
Mean Upside Capture	73%	81%	57%
Mean Geometric Return	10.6%	11.8%	8.4%
Mean Upside Capture	71%	79%	56%

See Graph 3

2

RETURNS FROM DYNAMIC HEDGING STRATEGIES

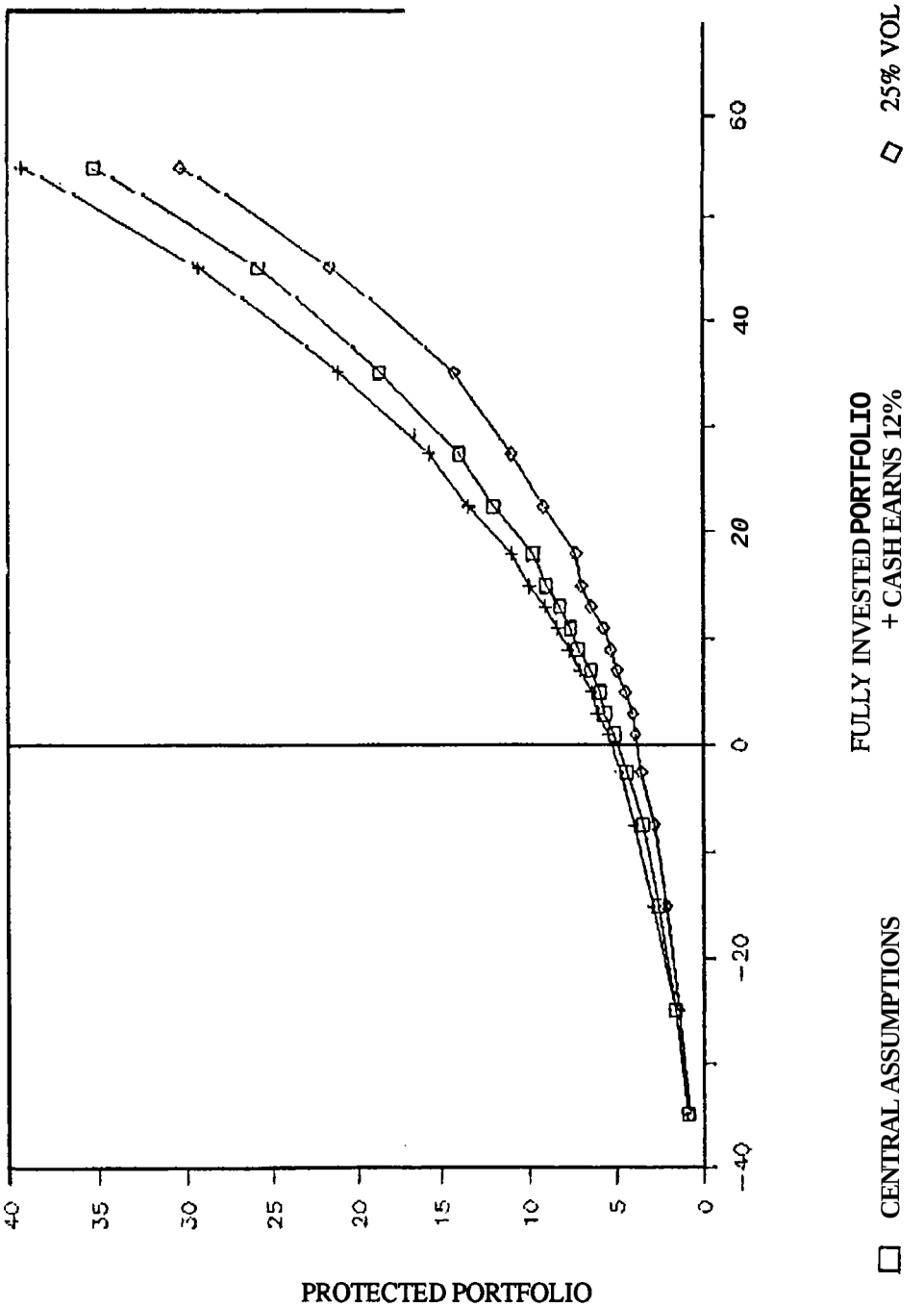
FACTORS WITHIN THE INVESTORS CONTROL



3

RETURNS FROM DYNAMIC HEDGING STRATEGIES

FACTORS OUTSIDE THE INVESTORS CONTROL



Comment on the Factors Effecting Results

Factors within the Investor's Control

A tolerance level of 2% instead of 5% allows a higher initial exposure to equities, and maintains a higher exposure as prices trend upwards. Consequently, this gives a higher upside capture when equity markets show a strong rise. However, the lower tolerance results in more 'whipsawing' taking place, and if equity returns are only moderate the cost of 'whipsawing' outweighs the benefit of a higher equity exposure.

A lower floor or a higher multiple both have the effect of increasing the exposure to equities. As a result they both lead to higher returns when equities do well and lower returns when equities do less well. A lower multiple reduces the sensitivity of the model, making it less vulnerable to whipsaw. It is interesting that although the comparison between a multiple of 5 and one of 3 shows the same mean arithmetic return, the model with the lower multiple gives a higher geometric return, indicating a smaller dispersion of likely returns.

Factors outside the Investor's control

A higher return on cash naturally gives a higher return overall. However, in the case where the riskless rate is 12%, the mean return relative to cash is very dissappointing. The incremental return from investing partly in equity has been eroded by transaction costs. In this case, a higher expected return from equities is needed to make portfolio protection look attractive.

High equity market volatility results in high dealing costs unless the multiple chosen is sufficiently low to compensate. In the example shown, with equities expected to outperform by 5% but with a volatility of 25%, the expected return is lower than that from cash.

4 - CONCLUSIONS

Capital protection strategies do not improve the traditional risk / return comparison. Instead they substitute one return distribution for another so as to suit the investors risk preference.

With dynamic hedging strategies there is still a small chance that the floor return will not be achieved. This will occur if a sudden large equity market decline is experienced, during which time the investor is unable to sell in sufficient quantity to reduce the exposure to the required level. Dynamic strategies rely on the liquidity of futures markets, and will yield dissappointing returns if the volume of money following these strategies is too large. In the extreme, this can lead to acute price corrections such as were seen in October 1987. High volatility in markets leads to a "whipsawing" effect of buying high and selling low which depresses returns.

Despite these problems, dynamic hedging can still be a useful tool if the following provisos are observed:

a) The risky asset used should be one in which other dynamic hedgers are not over-active;

b) The investor should have a full understanding of the risks involved;

c) The formula employed must be chosen carefully, reflecting the investor's attitude towards risk and his expectation of market return and volatility.

Options strategies can give the investor an absolute guarantee that the floor return will be achieved. They are far simpler to operate than dynamic hedging strategies, but are less flexible. It may be difficult to construct a viable strategy for longer time - horizons because the required instruments may not be available.

Capital protection strategies have a definite role to play in the investment planning of shorter term investors. The derivative product industry has seen huge growth wer the last ten years, which has encouraged the growth of capital protection strategies. Over the next ten years we will see further growth and innovation in derivative products, and further growth and innovation in the application of capital protection techniques.

BIBLIOGRAPHY

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2 See S P Sornes and M A Zurack, "Pension Plans, Portfolio Insurance and FASB Statement No 87". Financial Analysts Journal, Jan - Feb 1987.

3 *Source*: 'The Report of the Presidential Task Force on Market Mechanisms', alias The Brady Report', January 1988.

4 See F Black and R Rouhani, "Constant Proportion Portfolio Insurance and the Synthetic Put Option : A Comparison", Goldman Sachs Research, May 1987.

5 The formula is of the CPPI type. The results of simulating a synthetic put option stragegy *can* he found in 'The Cost of Portfolio Insurance : Tradeoffs and Choices", R G Clarke and R D Arnott, Financial Analysts Journal, Nov - Dec 1987.

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