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## The portfolio insurance puzzle

Techniques protect assets - and reduce long-term returns

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The financial community has recently shown a heightened interest in "portfolio insurance" techniques which have as their primary goal the "protection" of assets. My research indicates, however, that these techniques substantially reduce returns in the long run.

A number of financial institutions and consulting firms are marketing products under names such as "dynamic asset allocation/protective portfolio management," "portfolio insulation" and "portfolio risk control."

The portfolio insurance techniques synthetically creates a "protective put" which attempts to limit downside risk. The initial portfolio position consists of both a cash equivalent portfolio and an actively managed portfolio.

If the actively managed investments fall in value, a portion of it would be liquidated and invested in cash equivalents to protect remaining capital.

Conversely, cash equivalents would be traded for additional investments in the actively managed portfolio if it appreciates in value. This is because asset value appreciation permits a riskier posture by providing a larger buffer to protect asset values.

Portfolio insurance is not a market timing technique. There is no attempt to forecast returns.

Trades between the actively managed portion and the cash-equivalents portion of the portfolio are triggered by past returns. Investors select a time interval, usually a calendar year, for asset value protection.

While investors may be comforted by limiting losses for short intervals, they should recognize that the opportunity costs of the hedged position in cash equivalents will seriously hinder longer-term performance of their portfolio.

For example, one dollar invested in January 1928 would have grown to \$52.36 by the end of 1982 if invested in a Standard & Poor's 500 stock index portfolio that had been insured with an annual loss limitation of 5%. This, however, represents only one-half of the amount generated by an S&P 500 buy-and-hold strategy which would have returned \$104.25.

After taking into account the relatively modest transaction costs estimated to be 1% for commission and market impact, \$1.00 invested in the S&P 500 portfolio using an insured strategy would have grown to only \$36.97.

This is only one-third the level achieved by a buy-and-hold strategy.

Proponents of portfolio insurance often point to the last 10 years as a period when the technique would have produced favorable results. However, evidence from this period should be used with caution since this period was characterized by poor equity performance and unprecedented high short-term interest rates. Any strategy advocating large cash positions would have performed favorably.

For example, during the 10 years ending 1982, \$1.00 invested in an insured S&P 500 portfolio having an annual loss limitation of 5% would have grown to \$2.29 net of transaction costs.

A buy-and-hold strategy would have

generated \$1.90, but an investment in U.S. Treasury bills would have resulted in \$2.27, a level greater than that achieved by investing in a buy-and-hold S&P 500 strategy, and only two cents less than the return achieved using the insured strategy.

The examples above use a calendar year as the time interval and an S&P 500 portfolio as the actively managed segment. Although this is not always the case, the fundamental conclusions remain the same whether the chosen horizon is one year or longer, or whether an actively managed equity portfolio is used rather than a passive equity index portfolio. In addition, the selected interval of protection usually bears no relationship to the duration of the liabilities and is therefore arbitrary.

A problem could arise if the value of the actively managed portfolio fell significantly, since the entire active portfolio would have to be liquidated.

The portfolio would then consist only of the cash-equivalents until the beginning of the next performance period.

Accordingly, there would be no opportunity to participate in rising markets and the investor would be shut out of these gains, unless judgement was exercised to restart the technique.

This would have occurred for anyone using this strategy in 1933 when the entire active stock segment would have had to be liquidated early in the year. Subsequently the insured strategy would have produced a 5% loss for the calendar year vs. a 54% gain using a buy-and-hold S&P 500 strategy.

The pattern of the equity markets in

1982 came perilously close to producing a similar situation precluding investors from participating in the strong rally at yearend.

When using the insurance strategy, there are also potential slippages where the amount to be protected may not be fully protected. Since execution prices may differ from the price at the time of the sell signal, the entire protected value may fall below the protected amount.

In addition, since the expected volatility of the actively managed portion is a major factor in determining the size of the cash-equivalents position, the technique may fall if the volatility of the actively managed segment is misspecified. For example, the cash-equivalents position may be inadequate if the value of the actively managed segment happened to fall precipitously toward the end of the interval.

A portfolio allocated 61.75% to the S&P 500, and 38.25% to Treasury bills would have had the same volatility (as measured by the annual standard deviation) as the S&P 500 insured portfolio, but it would have also outperformed this portfolio. For the period 1928 to 1982, the return of an insured portfolio using this allocation would have exceeded that of one based on the S&P 500, by approximately 50 basis points. This is because transaction costs averaged 66 basis points for the insured portfolio.

Since the shifts between cash equivalents and the actively managed portions of the portfolio are not designed to profit from forecasted changes in relative returns, it is likely that an insured portfolio will underperform an allocated portfolio by the transaction costs incurred.

In addition, the vendors who insure the portfolios charge fees which I have not taken into account.

Because it has the same volatility, the allocated strategy would have provided the same average protection as that provided by the insured portfolio.

The pattern of annual losses would differ, however, based on the 5% maximum loss with portfolio insurance. So, the investor must address whether the 50 basis point sacrifice in annual return, plus the insurance vendor's fee, is a reasonable price to pay for the insured technique's pattern of returns.

The insurance technique limited the magnitude of a loss in any one year to 5%, however, it generated losses in 24 out of the 55 years as compared to only 17 years of losses under the allocated strategy. And, in only four cases did these annual losses significantly exceed 5%. For two of these four years annual losses exceeded 10%, and for the other two exceeded 20%. The largest annual loss was 26.5%.

It should also be noted that in some

years the loss limitation of the insurance technique would be comforting, while in others the opportunity cost of being shut out prior to a major market rally would be unsettling. In 1933, if an insured portfolio is compared to an annual allocate portfolio, the opportunity cost of being shut out was 38.4%.

In lieu of this, an appropriate approach to risk reduction would be to choose a balanced or multi-asset class portfolio. Such a portfolio should be broadly diversified across distinct asset classes to benefit from the lack of synchronization of asset class returns that lessens volatility. The mix of asset classes should be chosen in order to be efficient in maximizing expected return at any chosen level of volatility.

While with portfolio insurance the actively managed segment of the portfolio may be a multi-asset class portfolio, the trades between this balanced portfolio and the cash-equivalents portfolio would alter the mix of asset classes and thereby violate long-run efficiency.

Also keep in mind that equity real estate, an asset class highly recommended for balanced portfolios, may not be readily liquid at those times required by the insurance technique.

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