

## ASSET MIX AND FUTURE PERFORMANCE

by Ian Cooper  
London Business School

2nd April 1982

The asset mix of a fund is a prime determinant of its performance. One element in deciding how to split a fund between markets is a set of forecasts about how those markets will perform in the future over a period that is appropriate to the fund. Unfortunately, few people have the ability to forecast markets with any degree of accuracy, so there is always a large degree of uncertainty about what the relative performance of different markets will be.

This uncertainty about future performance is a second element that must be incorporated in the asset mix decision. Forecasts of expected future returns and estimates of volatilities of different markets can be combined to give an indication of the likely future performance of a fund given its asset mix.

### DOMESTIC EQUITY/ GILT/ MONEY AS INDIVIDUAL ASSETS

Table 1 gives average historical real returns (capital gain plus income) and variabilities for UK equities, gilts and treasury bills. As would be expected, the more volatile markets have given, on average, higher rates of return as compensation for this extra volatility.

**TABLE 1: The Performance of domestic security markets 1923-1980**

	Average Real Return	Variability
Equities	8.2%	24.0%
Long Gilts	1.0%*	13.1%
Bills	-0.6%	4.8%

\* The real yield on long gilts.

An investor who believed that he had no ability to forecast these markets could use this information in the following way. Suppose that he is interested in earning a positive real return on his fund, and accepts that his best forecast of how these markets will behave in the future is the historical information given in Table 1, adjusted for the current level of real interest rates.

Table 2 shows the chance of each asset earning a positive real return over a one-year horizon and a five-year horizon. Despite the higher volatility of the equity market, its high return makes it the asset of the three which is most likely to give a positive real return. The longer the horizon, the more attractive are equities for this purpose, since the impact of year-to-year fluctuation is reduced over a longer time period, and we cannot expect real interest rates to remain positive for long periods of time.

**TABLE 2: The chance of earning a positive real return on single asset portfolios**

	1 Year Horizon	5 Year Horizon
Equities	67%	70%
Long Gilts	62%	63%
Bills	64%	58%

Table 2 is illustrative, and is constructed using the numbers from Table 1, adjusted for the current level of real interest rates. An alternative question that the fund manager might be interested in is 'How badly could the fund do?' Table 3 illustrates this, again using single asset portfolios.

**TABLE 3: The level of real return guaranteed with 90% confidence**

	1 Year Horizon	5 Year Horizon (annual rate)
Equities	-24.4	-12.5
Long Gilts	-15.0	-10.6
Bills	-4.8	-3.7

The figures given in Table 3 are the returns from these assets which are ninety percent certain of being exceeded. A manager who is interested in the potential downside risk of his assets gets an indication from these figures of the risk exposure of individual assets.

**DOMESTIC EQUITY/ GILT/ MONEY PORTFOLIOS**

Variability can be reduced through diversification by holding assets in portfolios. For instance, only about half of the movement of the U.K. equity market is related to the movement of the U.K. gilt market, so by holding the assets in combination, the risk of the portfolio is reduced.

**TABLE 4: The chance of earning a positive real return on combined portfolios**

		1 Year Horizon	5 Year Horizon
50:50	Equities/Gilts	67%	72%
50:50	Equities/Gilts	69%	74%
50:50	Bills/Gilts	64%	63%
33:33:33	Equities/Gilts/Bills	68%	72%
*25:5:70	Equities/Gilts/Bills	70%	
**65:0:35	Equities/Gilts/Bills		74%

\* Best portfolio for this purpose for a 1 year horizon.  
 \*\* Best portfolio for this purpose for a 5 year horizon.

Table 4 presents information of the chance of earning a positive real return on various portfolio combinations of equities, gilts and bills. The investor who wishes to give himself the best chance of earning a positive real return over the next year should hold a portfolio which is heavily in bills, with the remainder largely in equities. Over a five-year horizon, the situation is reversed; the best portfolio for this purpose is largely in equities, with 35% bills.

The reasons for these results are simple. High real interest rates currently mean that bills are a very attractive way of guaranteeing a positive real return on a portfolio. Over five years, however, we do not expect these real rates to remain at their current level, so equities become attractive as they generate on average a premium return as compensation for their risk.

## **OTHER ASSETS, OTHER OBJECTIVES**

I have illustrated with a fairly simple example the way that the implications of asset mix decisions for future performance can be examined. All the examples were analysed using the London Business School Strategic Asset Allocation Service, which is an interactive computer package designed for this purpose. I should be pleased to give further information on request.

Of course, no fund considers only U.K. equities, gilts and bills and no fund has the simple single goal of making as sure as possible that it earns a positive real rate of return. These examples are intended to illustrate a general approach that is gaining favour in the U.S. investment community and beginning to penetrate the U.K. market.

For a fund which has a combination of goals including a target rate of return, income generation, and safety, the same approach can be used, and property, indexed gilts, preference shares and overseas securities can be easily incorporated into the analysis.

## ASSET MIX AND FUTURE PERFORMANCE

by Ian Cooper  
London Business School

2nd April 1982

The asset mix of a fund is a prime determinant of its performance. One element in deciding how to split a fund between markets is a set of forecasts about how those markets will perform in the future over a period that is appropriate to the fund. Unfortunately, few people have the ability to forecast markets with any degree of accuracy, so there is always a large degree of uncertainty about what the relative performance of different markets will be.

This uncertainty about future performance is a second element that must be incorporated in the asset mix decision. Forecasts of expected future returns and estimates of volatilities of different markets can be combined to give an indication of the likely future performance of a fund given its asset mix.

### DOMESTIC EQUITY/ GILT/ MONEY AS INDIVIDUAL ASSETS

Table 1 gives average historical real returns (capital gain plus income) and variabilities for UK equities, gilts and treasury bills. As would be expected, the more volatile markets have given, on average, higher rates of return as compensation for this extra volatility.

**TABLE 1: The Performance of domestic security markets 1923-1980**

	Average Real Return	Variability
Equities	8.2%	24.0%
Long Gilts	1.0%*	13.1%
Bills	-0.6%	4.8%

\* The real yield on long gilts.

An investor who believed that he had no ability to forecast these markets could use this information in the following way. Suppose that he is interested in earning a positive real return on his fund, and accepts that his best forecast of how these markets will behave in the future is the historical information given in Table 1, adjusted for the current level of real interest rates.

Table 2 shows the chance of each asset earning a positive real return over a one-year horizon and a five-year horizon. Despite the higher volatility of the equity market, its high return makes it the asset of the three which is most likely to give a positive real return. The longer the horizon, the more attractive are equities for this purpose, since the impact of year-to-year fluctuation is reduced over a longer time period, and we cannot expect real interest rates to remain positive for long periods of time.

**TABLE 2: The chance of earning a positive real return on single asset portfolios**

	1 Year Horizon	5 Year Horizon
Equities	67%	70%
Long Gilts	62%	63%
Bills	64%	58%

Table 2 is illustrative, and is constructed using the numbers from Table 1, adjusted for the current level of real interest rates. An alternative question that the fund manager might be interested in is 'How badly could the fund do?' Table 3 illustrates this, again using single asset portfolios.

**TABLE 3: The level of real return guaranteed with 90% confidence**

	1 Year Horizon	5 Year Horizon (annual rate)
Equities	-24.4	-12.5
Long Gilts	-15.0	-10.6
Bills	- 4.8	- 3.7

The figures given in Table 3 are the returns from these assets which are ninety percent certain of being exceeded. A manager who is interested in the potential downside risk of his assets gets an indication from these figures of the risk exposure of individual assets.

**DOMESTIC EQUITY/ GILT/ MONEY PORTFOLIOS**

Variability can be reduced through diversification by holding assets in portfolios. For instance, only about half of the movement of the U.K. equity market is related to the movement of the U.K. gilt market, so by holding the assets in combination, the risk of the portfolio is reduced.

**TABLE 4: The chance of earning a positive real return on combined portfolios**

		1 Year Horizon	5 Year Horizon
50:50	Equities/Gilts	67%	72%
50:50	Equities/Gilts	69%	74%
50:50	Bills/Gilts	64%	63%
33:33:33	Equities/Gilts/Bills	68%	72%
*25:5:70	Equities/Gilts/Bills	70%	
**65:0:35	Equities/Gilts/Bills		74%

\* Best portfolio for this purpose for a 1 year horizon.

\*\* Best portfolio for this purpose for a 5 year horizon.

Table 4 presents information of the chance of earning a positive real return on various portfolio combinations of equities, gilts and bills. The investor who wishes to give himself the best chance of earning a positive real return over the next year should hold a portfolio which is heavily in bills, with the remainder largely in equities. Over a five-year horizon, the situation is reversed; the best portfolio for this purpose is largely in equities, with 35% bills.

The reasons for these results are simple. High real interest rates currently mean that bills are a very attractive way of guaranteeing a positive real return on a portfolio. Over five years, however, we do not expect these real rates to remain at their current level, so equities become attractive as they generate on average a premium return as compensation for their risk.

## **OTHER ASSETS, OTHER OBJECTIVES**

I have illustrated with a fairly simple example the way that the implications of asset mix decisions for future performance can be examined. All the examples were analysed using the London Business School Strategic Asset Allocation Service, which is an interactive computer package designed for this purpose. I should be pleased to give further information on request.

Of course, no fund considers only U.K. equities, gilts and bills and no fund has the simple single goal of making as sure as possible that it earns a positive real rate of return. These examples are intended to illustrate a general approach that is gaining favour in the U.S. investment community and beginning to penetrate the U.K. market.

For a fund which has a combination of goals including a target rate of return, income generation, and safety, the same approach can be used, and property, indexed gilts, preference shares and overseas securities can be easily incorporated into the analysis.