

CHAPTER 9

MUTUAL FUNDS (UNIT TRUSTS, OEICS, INVESTMENT TRUSTS)

The objective of this chapter is to provide knowledge of:

1. The purposes of mutual funds.
 2. Unit trusts, OEICs, and investment trusts.
 3. Index (tracker) funds.
 4. The effects of charges and taxation on investment returns.
 5. Tax-advantaged investment schemes.
 6. Pound cost averaging.
 7. The Evidence on the Performance of Mutual Funds.
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Benefits of Mutual Funds

A major form of institutional investment is the mutual fund. Mutual funds come in many varieties. In the United Kingdom there are three broad types. These are investment trusts, unit trusts, and OEICs (Open-Ended Investment Companies – pronounced ‘oiks’). Some people prefer to restrict the term ‘mutual funds’ to unit trusts and OEICs, but this is just a matter of semantics. Similar instruments exist in other countries, but often with different names. These forms of collective investment have both similarities and differences.

All forms of mutual fund allow investors to have a spread of investments for a small money outlay. For example £1,000 can buy part of a fund, which contains more than 100 different shareholdings. In this way small investors can enjoy the risk reduction benefits of a well-diversified portfolio. Stockbroker commission costs would render the acquisition of a large number of different shareholdings impractical for small investors. The returns from mutual funds come in two forms; one is the dividend (or interest) income from the investments and the other is the increase in the prices of the investments. There is a risk that prices fall but diversification reduces this risk since, to some extent, losses on some investments will be offset by gains on others.

Mutual funds provide other advantages to investors. They provide administration of the investments on behalf of investors. For example dividends could be automatically reinvested on behalf of the investors. They remove the need for investors to ascertain which shares or bonds to buy, the choice is made by professional fund managers. However these services have to be paid for by annual fees taken from the dividends (or from the capital of the fund), and it is controversial as to whether the investment choices of professional fund managers are, on average, superior to random stock selections.

Mutual funds permit a choice of investment strategy. There are general, high income, and growth funds. There are funds that focus on asset classes, for example funds that invest exclusively in bonds. Many funds allow for particular geographical orientations (Europe funds, North America funds, Far East funds, etc.).

Differences between Unit Trusts, Investment Trusts and OEICs

A unit trust is a fund managed by a bank, insurance company, or investment company. Individual investors buy units in the fund. An investment trust is a company whose purpose is to invest in other companies. Individual investors buy shares in the investment trust company. An OEIC (Open-Ended Investment Company) is a company whose purpose is to invest in other companies (like an investment trust). Individual investors buy shares in funds operated by the OEICs, but these shares are similar to the units sold by unit trusts.

An investment trust has a board of directors, which decides on broad investment strategy and objectives. The implementation of the strategy and objectives is normally carried out by an investment management company. A unit trust is constituted by a trust deed. The unit trust manager is responsible for the day-to-day operation of the fund (the manager is normally an insurance company, bank, or investment company). Each unit trust fund has a trustee, which must be independent of the manager. The role of trustee is normally taken by a bank or insurance company. The trustee is custodian of the assets (e.g. it holds the share certificates), maintains a register of unit holders, and generally oversees the management of the trust fund. The trustee has the role of protecting the interests of unitholders and ensuring that the managers do not stray from their stated objectives. The managers are able to advertise and market unit trusts directly to

the public. The funds are exempt from capital gains tax; instead such taxes are payable by unitholders whose individual capital gains exceed the personal exemption limit (investment trusts and their investors receive similar treatment in relation to capital gains tax). UK authorised unit trusts investing in equities can hold no more than 10% of the fund in any one company, and no more than 10% of the issued capital of a company can be held.

Unit trusts are open ended. The purchase or sale of units by individual investors causes the fund to expand or contract. Likewise the number of units increases or decreases. The transactions are carried out with the investment manager. OEICs are similar to unit trusts in these respects. Investment trusts are closed funds. The purchase or sale of shares by individual investors has no effect on the size of the fund. An unchanged number of shares change hands. Transactions are carried out with other investors through the medium of a stock exchange. In the case of investment trusts day-to-day fluctuations in demand are reflected in moving share prices. By contrast, unit trust (and OEIC) managers regularly issue new units (or shares) or buy back existing ones in order to accommodate fluctuations in demand.

Since sales of shares in investment trusts do not require the fund manager to sell any of the assets, the manager need not be concerned about the liquidity of the assets. This facilitates investments in illiquid markets such as private equity (venture capital), other small firms, and emerging markets. The sale of unit trusts and OEICs involves the liquidation of part of the fund. Assets need to be sold in order that the investment manager can redeem units. For this reason the managers of unit trusts and OEICs need to hold part of the fund in liquid assets. In particular part of the fund might be held on deposit in banks so as to avoid the sale of securities (shares, bonds) in the event of units being redeemed. This is likely to reduce the expected rate of return on the fund. If there is a substantial volume of sales by investors, the fund manager will be forced to sell securities. If the markets for those securities are not liquid, the sales could be at unfavourable prices. The problem is compounded by the possibility that redemptions will peak during times of market uncertainty with the result that asset sales occur when the markets are least liquid. The inflows and outflows of funds generated by retail investors can cause unit trusts and OEICs to be active buyers and sellers. As a result they can have a significant effect on stock market prices.

In the case of unit trusts, the value of a unit is directly based on the value of the investments in the fund. The total value of the units equals the total value of the investments in the fund. OEICs are similar to unit trusts in this respect. Unit trusts and OEICs must be valued on a daily basis, and to facilitate this they tend to restrict their investments to those whose prices are quoted every day (such as shares that are listed on a stock exchange). In the case of investment trusts, the total value of the investment trust shares normally differs from the total value of the investments held by the fund. The prices of investment trust shares are determined by demand and supply, and these forces can pull the value of an investment trust company away from the value of the investments that it holds. Net asset value (NAV) is the market value of all the assets held by the investment trust (net of liabilities) divided by the number of investment trust shares issued. If the price of the investment trust shares is less than the net asset value, those shares are said to trade at a discount to net asset value. If the price of the shares exceeds the net asset value, they are said to trade at a premium. In other words, if the total value of the investment trust shares is less than the value of the investments (net of any debts) held by the trust, the price of the investment trust shares is said to be at a discount to net asset value; in the opposite situation the shares are said to be trading at a premium to net asset value.

Exercise 9.1

Acme Investment Trust holds £100 million of shares, in a total of 200 companies, in its fund. There are 50 million Acme Investment Trust shares in issue. The Acme Investment Trust share price is 160p. What is the Net Asset Value (NAV), and the percentage discount?

Answer

The Net Asset Value is:

$$£100,000,000/50,000,000 = £2$$

The money value of the discount is $200p - 160p = 40p$ per share. The discount is $40p/200p = 0.2$, which as a percentage is 20%. Acme Investment Trust shares trade at a discount of 20% to Net Asset Value.

Unit trusts typically involve a difference between the buying (offer) price and the selling (bid) price. Frequently buying prices are 5-7% higher than selling prices (buying from the unit trust manager and selling back to the manager). Investment trusts and OEICs have a single price, although the buyer of an OEIC may have to pay an initial charge or the seller of an OEIC may have to pay an exit (withdrawal) charge. In the case of investment trusts, transaction costs are incurred through commission payments to brokers rather than via a spread between buying and selling prices (although, as with other shares, there will be a small bid-offer spread).

Unit trusts and OEICs are bought from the investment manager, and are redeemed by being sold back to the investment manager. In the case of investment trusts, shares are bought and sold through the stock market. One feature that distinguishes OEICs from unit and investment trusts is the fact that they are umbrella funds. There are several different funds within an OEIC.

OEICs came into existence in 1997 as a result of European legislation to create a single European market for investment products (Roberts 2004). Unlike unit trusts, OEICs are not based on trust law. They are based on specially framed company law. In common with European practice, OEIC shares have a single price rather than the separate buying (offer) and selling (bid) prices of unit trusts. OEICs seem to be gradually replacing unit trusts.

Another difference between investment trusts, on one hand, and unit trusts and OEICs, on the other, concerns the ability to borrow. Investment trusts have very extensive borrowing powers and can thereby increase their exposure to stocks by using borrowed money to buy shares. This is known as gearing or leverage. This increase in market exposure can render investment trust prices more volatile than those of unit trusts and OEICs, which are able to borrow only up to 10% of the fund. Another factor that can cause investment trust prices to be more volatile than those of unit trusts and OEICs is the existence of discounts and premiums. Investment trust prices can change as a result of variations in discounts and premiums,

whereas unit trusts and OEICs do not have this source of price volatility. The increased risk arising from gearing has been suggested as an explanation for the discount on many investment trusts.

Exercise 9.2

An investment trust has 100% gearing (the principal investment has been matched by borrowing so as to double the size of the shareholding). If the money is borrowed at 6% p.a., what would be the return on the principal investment in the event of stock returns of (a) 0%, (b) 3%, (c) 8%, and (d) 15% p.a.

In the event of a sudden (e) halving, and (f) doubling, of the value of the shares held by the investment trust, what would happen to the value (NAV) of the investment trust?

Answer

- (a) If the portfolio return is 0% p.a. but 6% must be paid on a sum equal to the principal investment, the rate of return on the principal investment would be -6% p.a.
- (b) If the total portfolio return is 3% p.a., this is equivalent to 6% p.a. on the principal investment since the total portfolio is double the principal investment. There is 6% p.a. interest on a sum equal to the principal investment. So the net return is $6\% - 6\% = 0\%$ p.a.
- (c) If the total portfolio return is 8% p.a., this is equivalent to 16% p.a. on the principal investment since the total portfolio is double the principal investment. There is a 6% p.a. rate of interest on a sum equal to the principal investment. So the net return is $16\% - 6\% = 10\%$ p.a.
- (d) If the total portfolio return is 15% p.a., this is equivalent to 30% p.a. on the principal investment. So the net return is $30\% - 6\% = 24\%$ p.a.
- (e) If the value of the shares held by the investment trust suddenly halved in value, there would be a loss equal to the principal investment (the value of the total portfolio was double the value of the

principal investment). The assets would now be matched by liabilities (investments matched by debts) meaning that the investors have lost all their money but the debt can be repaid.

- (f) If the value of the shares had suddenly doubled, the value of the shareholding would be four times the original principal investment. Net of the debt, the investment trust (its NAV) would be three times the value of the original principal investment. Investors would have tripled their wealth as a result of the doubling of share prices (ignoring any changes in discounts/premiums).

Some investment trusts are split-capital trusts. Split-capital trusts are split into income shares and capital shares. The holders of the income shares receive all the dividends from the investment trust plus a predetermined return of capital. Since the holders receive the dividends from the investments in capital shares as well as the dividends on their own investments, the holders of income shares may have a very high-yield (high income yield) investment. The holders of the capital shares receive all the capital gains. The holders of the capital shares have a highly geared investment. They receive all the capital gains (from both their own investments and those of the holders of income shares) but would suffer the whole of any capital losses. Split-capital investment trusts have a winding up date on which the assets are sold and the proceeds distributed to the holders of the investment trust shares.

Some split-capital investment trusts issue zero dividend preference shares, alternatively known as zeros. Zero dividend preference shares pay nothing to the investor until the share matures. The return to the investor arises from the fact that the shares are bought at a discount to (a lower price than) the sum to be paid at maturity.

Unit investment trusts also have maturity dates. Unit investment trusts use passive fund management in the form of the buy-and-hold strategy. Assets are bought and held until the unit investment trust matures. The investments purchased are not changed during the life of the fund. The fund accepts initial capital from investors, and that capital is invested. There are no further cash flows into the fund from investors. The

initial investments are held until the fund matures, and income from those investments is distributed to the investors. On the maturity date of the fund the investments are sold and the capital returned to the investors. Unit investment trusts frequently invest in bonds.

In the cases of unit trusts and OEICs the ultimate investor is taxed in almost exactly the same way as if he or she held the underlying assets directly. It is the unitholder or shareholder who is liable to tax, not the fund. In order to be exempt from capital gains tax, an investment trust must satisfy the following conditions. The company's income is derived at least 70% from securities. No single holding can exceed 15% of the fund. The investment trust's shares are quoted on the London Stock Exchange. The company must not distribute realised capital gains as dividends. It does not retain more than 15% of the income it receives from investment in securities. If an investment trust meets these conditions, liability for capital gains tax falls upon the investor rather than the investment trust (and many investors would have capital gains that fall below the annual exemption limit).

Unit trusts and OEICs are often available as either income or accumulation units (or shares). Income units pay the dividends to the investors whereas accumulation units reinvest the dividends (so as to enhance the rate of price increase). Investment trusts do not have such a division. Investment trusts distribute most of the dividends to their shareholders, but may retain some to reinvest within the fund.

Investment Trust Share Buy-Backs

In some cases the managers of investment trusts attempt to reduce the size of the discounts. One method entails the investment trust buying its own shares in order to increase demand and hence the share price. The bought-in shares can either be cancelled or held in treasury. Shares held in treasury can be re-issued at a later date. If the repurchase of shares maintains a limit to the size of the discount, and if investors come to believe that the discount will be limited to that size, arbitrage could maintain the limit without the investment trust managers repurchasing shares. Arbitragers would buy shares, if the discount exceeded the limit, in the belief that the investment trust manager would maintain the limit. The arbitragers would buy the investment trust shares at the high discount, and hence low price, in the knowledge that they will be

able to sell the shares at a lower discount (and hence higher price) to the investment trust manager. By buying the shares, the arbitragers raise the share price and thereby maintain the limit. In consequence the investment trust manager may not need to buy back shares.

The repurchase of shares by the investment trust manager is likely to enhance the return to shareholders. This is partly because the buyback reduces the discount and hence raises the share price. It is partly because repurchasing at a discount entails buying into the investment trust portfolio at an advantageous price. The latter effect is illustrated by the following example.

The shares of an investment trust are priced at 320p and the Net Asset Value (NAV) per share is 400p. This implies a 20% discount. The investment trust has issued 100 million shares. The investment trust holds investments of £400 million ($400\text{p} \times 100\text{ million}$). The market capitalisation of the investment trust is £320 million ($\text{£}3.20 \times 100\text{ million}$).

Suppose that the investment trust buys back 15 million shares (15% of the outstanding issue is the maximum allowed in one financial year). The cost of the buy-back would be $320\text{p} \times 15\text{ million} = \text{£}48\text{ million}$ (assuming that the buy-back does not immediately raise the share price). The money used for the buy-back is taken from the assets held by the investment trust. The NAV falls to £352 million ($\text{£}400\text{ million} - \text{£}48\text{ million}$). The number of shares has fallen to 85 million ($100\text{ million} - 15\text{ million}$) with the result that the NAV per share has risen to $\text{£}352,000,000/85,000,000 = \text{£}4.14$ (414p). This is a 3.5% increase in NAV per share. If the discount remains at 20%, there would also be an increase in the share price of 3.5% (since the ratio between NAV per share and the share price would be unchanged).

This effect on the share price arises from the fact that buying at a discount entails buying the shares, held by the investment trust, cheaply. Investors who sell the investment trust shares receive £48 million but give up a claim on £60 million of investments within the trust. The remaining shareholders profit by £12 million ($\text{£}60\text{ million} - \text{£}48\text{ million}$). The effect would be lessened if the share price rose during the buy-back.

However such a share price rise would directly benefit existing shareholders (it would reduce the discount).
(This example is based on one given in the Witan Investment Trust PLC Report and Accounts for 2005).

Exercise 9.3

An investment trust trades at a 20% discount to Net Asset Value, which amounts to £100 million. The investment trust manager spends £10 million on buying back shares.

- (a) If the discount remains at 20%, what happens to the share price?
- (b) If the discount immediately falls to 10%, and remains at that level, what happens to the share price?

Answer

The market capitalisation (share price x number of shares) is £100 million x 0.8 = £80 million.

(a) For every £100 of previous Net Asset Value, £90 now remains since £10 has been used to repurchase shares. For every £80 of previous market capitalisation, £70 now remains since £10 worth of shares has been repurchased.

The implied discount rate is: $1 - (\text{market capitalisation}/\text{net asset value})$.

The implied discount is: $1 - (70/90) = 0.2222$, i.e. 22.22%.

In order for the discount to return to 20%, the market capitalisation must rise to £90 million x 0.8 = £72 million. The required rise in the share price is $(72/70) - 1 = 0.0286$, i.e. 2.86%.

The share price rise is brought about by the purchase of a portion of the portfolio at a discounted price.

(b) For every £100 of previous Net Asset Value, £90 now remains since £10 has been used to repurchase shares.

The market capitalisation first moves to £90 million to reflect the 10% discount.

It then falls to £80 million because of the share buy back.

The implied discount is: $1 - (80/90) = 0.1111$, i.e. 11.11%.

A further change is required to restore the 10% discount. The market capitalisation should rise to £81 million.

For every 100 shares previously in issue, there are now $(80/90) \times 100 = 88.88$ shares. For every £80 of previous market capitalisation, there is now £81. This implies a share price rise of $[(100/88.88) \times (81/80)] - 1 = 0.1391$, i.e. 13.91%. [If the market capitalisation were unchanged a fall in the number of shares from 100 to 88.88 would need to be offset by a share price rise of $100/88.88$. If the market capitalisation increases, the share price rise would need to be correspondingly greater.]

The share price rise is brought about by two factors. One factor is the effect of buying a portion of the portfolio at a discounted price. This factor can be repeated in subsequent periods. The other factor is a narrowing of the discount. There is likely to be a limit to the effect of this factor such that it cannot be repeated for many periods.

The narrowing of the discount provides a return of $(90/80) - 1 = 0.125$, i.e. 12.5%. This implies that the effect of buying at the discounted price is an addition to return of $13.91 - 12.5 = 1.41\%$. It might be noted that this figure is very close to half the return arising from buying into the portfolio at a discount of 20%.

Another approach to reducing discounts is to allow, at frequent intervals, investors to sell their shares to the investment trust manager at a small, predetermined discount. The belief is that this facility will support the

share price and prevent large discounts from occurring since the emergence of a large discount would entice share purchases by investors who know that they can resell the shares to the manager at a low discount. The danger of a regular buyback programme is that the investment trust could shrink until it is too small to be viable. It also removes the advantage that investment trusts have in being able to buy illiquid investments knowing that they cannot be forced to sell them to meet investor redemptions.

Share buyback programmes also compromise the closed-ended nature of investment trusts. The closed-ended nature of investment trusts is also reduced by the new (since 2003) facility to hold shares in treasury. Shares held in treasury can be re-issued so that increases in demand may be accommodated by the re-issue of shares. The effects are that both reductions in demand, and increases in demand, can be met by changes in the number of shares in issue rather than by movements in the share price.

EXHIBIT 9.1

Example of an investment trust using share buy-backs (share repurchases)

JPMorgan Fleming Mercantile Investment Trust plc (31/07/2007)

Objective

Long-term capital growth from a portfolio of UK medium and smaller companies.

Investment Policy

- To emphasise growth from medium and smaller companies. Long-term dividend growth at least in line with inflation.
- To use long-term gearing to increase potential returns to shareholders. The Company's gearing policy is to operate within a range of 90% to 120% invested.
- To invest no more than 15% of gross assets in other UK listed investment companies (including investment trusts).

Benchmark

The FTSE All-Share Index excluding constituents of the FTSE 100 Index and investment trusts.

Financial Data (abridged)

Shareholders' funds	£1,519,269,000
Number of shares in issue	107,659,958
Net asset value per ordinary share with debt at fair value	1,404.3p
Share price	1,242.0p
Discount of net asset value to share price with debt at fair value	11.6%

Table 9.A**Share Repurchases**

The Board has maintained its active approach towards share repurchases in order to enhance the net asset value and minimise the absolute level and volatility of the discount on the Company's shares. In the six months to 31st July 2007, 17,398,801 shares were repurchased for cancellation at a total cost of £233.6m. Those purchases added approximately 22.6p to the net asset value per share. The discount, with debt at fair value, has ranged between 7.6% and 12.3% in the period from 1st February to 21st September 2007, with the average discount during the period 9.9%.

Ten Largest Investments (as percentages of total net assets)

Taylor Wimpey	3.0%
GKN	2.0%
Ladbrokes	2.0%
Burberry	1.8%
Investec	1.8%
Kesa Electricals	1.8%
Berkeley	1.7%
EMI	1.6%

Travis Perkins	1.6%
Mondi	1.5%

Table 9.B

Source: JPMorgan Asset Management

Explanations for Investment Trust Discounts and Premiums

It is not well understood why many investment trusts trade at a discount to net asset value. One explanation is that the discount reflects the management charges that are paid out of the fund. If the share price is seen as the present value of expected future dividends, and dividends are net of fund management charges, the share price will be depressed by the effect of charges on net dividend receipts. Gemmill and Thomas (2006) found that charges tend to be high when there is a large board of directors, and when the members of the board largely come from the fund management company running the investment trust. However high fees were found to be associated with low ownership of the investment trust shares by the management company whereas discounts were large when the fund management company owned a large stake. This seems to suggest that large discounts are associated with low charges.

Another explanation runs in terms of poor investment performance causing share sales, which push down the prices of investment trust shares thereby creating (or increasing) discounts. (Conversely strong investment performance could produce premiums to net asset value.) Fund charges and the perceived quality of fund management, as explanations for discounts and premiums, have been discussed by Ross (2002). A third explanation points to the fact that investment trusts often hold assets that are not easily valued. Such assets include unquoted shares and the infrequently traded shares of very small companies. Uncertainty as to net asset value may be partially responsible for discounts. Pontiff (1996) demonstrated that deviations of price from net asset value were related to (non-systematic) risk; high risk was associated with large deviations.

Barclay, Holderness and Pontiff (1993) argued that discounts are related to block ownership (typically by institutional investors). They suggested that holders of large blocks of closed-end fund (investment trust) shares could use their voting power to obtain benefits not available to other shareholders. In consequence other investors might discount prices to an extent that reflects the diversion of benefits to block holders away from other investors. Niendorf and Beck (2007) argued an opposing case to the effect that block holders (institutional investors) have the power to prevent fund managers from behaving in ways detrimental to shareholders. Such a surveillance role would be expected to reduce discounts. The analysis of the discounts (and occasionally premiums) continues to be a subject of research (for example Ferguson and Leistikow 2001; Lee, Shleifer and Thaler 1991).

Much of the debate concerning the explanation of discounts and premiums centres around the issue of investor rationality. Lee, Shleifer and Thaler propose that fluctuations in discounts are driven by changes in investor sentiment, and changes in sentiment are seen as reflecting irrational behaviour. Discounts are high when investors are pessimistic about future returns, and low when investors are optimistic. This is a general market sentiment that affects all investment trusts and other investments. The reason why investment trusts, on average, exhibit discounts is explained in terms of the additional risk imparted by the effects of unpredictable changes in sentiment.

Ferguson and Leistikow (2004) take the view that discounts and premiums can be explained without supposing that investors behave in an irrational manner. They explain discounts and premiums in terms of expected investment performance. One piece of evidence cited in favour of their view is the mean reversion of discounts following changes in fund managers. When the managers of a fund change the discount reverts towards the average investment trust discount. This is consistent with the view that the previous discount reflected the expected performance of the previous fund managers, and is not easily explained in terms of market-wide changes in investor sentiment. Conversely it is difficult to invoke a rational explanation for the tendency of investors to buy newly-created investment trusts at a premium when past experience indicates that initial premiums soon turn into discounts, thereby providing early losses for the investors.

Exercise 9.4

An investor has £100,000 to invest. The investor does not want to manage the investment over time.

Assuming an average dividend yield of 4% p.a. on shares, compare the net dividend yield from:

- (a) direct investment in a portfolio of shares,
- (b) purchase of shares in an investment trust which has annual charges of 1% on NAV (Net Asset Value) and whose shares sell at a 25% discount.
- (c) What implications might be drawn about the explanation of the discount?
- (d) How might the implications change if the discount were 20%?

Answer

- (a) The dividend yield is 4% p.a., i.e. £4,000 p.a.
- (b) If the investment trust sells at a 25% discount, the share price is 0.75 x NAV. So

$$\text{NAV} = \text{share price}/0.75 = 1.33 \times \text{share price}.$$

There is a dividend yield of 4% p.a. on NAV, and charges of 1% p.a. on NAV, leaving a net dividend yield of 3% p.a. The net dividend yield for a holder of the investment trust is $3\% \times 1.33 = 4\%$ p.a., i.e. £4,000 p.a.

The value of the dividends on NAV is 4% of £133,333, that is £5,333. From this, a charge of 1% of £133,333 (i.e. £1,333) is deducted. The dividend payable to the investor amounts to £5,333 - £1,333 = £4,000.

(c) The dividend yields from (a) and (b) are equal. The effect of the discount offsets the charges when considering the rate of yield on the investment trust. This might be seen as implying that charges can explain the discount. The price of the investment trust falls to the extent required to raise the rate of yield sufficiently to offset the cost of the charges.

- (e) If the discount were 20%, the share price would be 0.8 x NAV. So

$$\text{NAV} = \text{share price}/0.8 = 1.25 \times \text{share price}.$$

The dividend yield on NAV, after charges, is 3% p.a. The dividend yield on the investment trust shares is $3\% \times 1.25 = 3.75\%$ p.a. This is below the 4% p.a. from direct investment in shares. The perceived

quality of investment management, or the convenience of the management being carried out on the investors' behalf, could explain why the discount is less than 25%. Investors are willing to forgo 0.25% p.a. in order to benefit from professional investment management.

Index (Tracker) Funds

An index fund, alternatively known as a tracker fund, aims to replicate the performance of a stock index. The emergence of index funds arose from the observation that actively managed funds fail, on average, to outperform stock indices. This is related to the issue of market efficiency. Active fund management is predicated on the view that portfolio managers can forecast market movements and the performance of individual stocks relative to the market with the effect that they can consistently outperform stock indices. If the Efficient Market Hypothesis is correct, it is not possible to consistently forecast either overall market movements or the relative performance of individual stocks. If this is the case, investors should avoid the transaction and management costs associated with actively managed funds by investing in index funds whose aim is merely to move in line with the stock market (as measured by a stock index).

One advantage of index funds, to the individual investor in collective investments, is that they avoid management risk. The performance of actively managed funds can, during any period of time, vary considerably. Some will outperform a stock index and others will under-perform it. The difference between the best and the worst can be considerable. If the direction and size of the deviations from the index occur by chance, as empirical evidence seems to suggest (see the chapters on market efficiency and the evaluation of fund managers), the individual investor faces a management risk. Individual investors run the risk that their chosen funds are relatively poor performers. By investing in index funds they avoid this management risk (which is also known as active risk).

Another advantage of index funds, relative to actively managed funds, is that they ensure that the portfolio remains diversified. Actively managed funds, in their attempts to outperform the market, may hold poorly

diversified portfolios. For example, they may tilt the portfolio towards particular sectors. To the extent that actively managed funds hold inadequately diversified portfolios, they sacrifice part of the risk reduction benefit of diversification. However some stock indices, and hence some index tracker funds, can be concentrated on a few sectors.

Probably the greatest advantage of index funds is that they are much cheaper to run than actively managed funds. For example, many actively managed UK unit trusts and OEICs have a 6% initial charge, an annual 1.5% management charge, and transaction costs around 1% per year. This compares with index tracker funds which typically have a zero initial charge, a 0.5% annual charge, and minimal transaction costs.

In 2002 the Sandler report noted that the average actively managed UK unit trust under-performed the stock market by about 2.5% p.a., largely because of charges. However more than 90% of retail investors choose actively managed unit trusts rather than index trackers. The Sandler report suggested that this predominance of actively managed fund purchases was probably because they pay more commission to financial advisers. Since tracker funds pay lower commission to financial advisers, the advisers are less likely to recommend them to their clients.

A drawback of index funds is that they tend to omit the shares of very small firms. Even broad indices have a cut off in terms of company size. For example, in the UK the FT All Share Index covers about 800 stocks. This eliminates more than 1,000 firms whose market capitalisations are not sufficient. Actively managed funds are able to include any stocks, including those with very small market capitalisations.

Tracking Error

Portfolios constructed to replicate an index rarely succeed in precisely tracking the index. The tracking error is the difference between the total return on the replicating portfolio held by the index fund, and the total return on the index. The total return consists of both dividends and capital gains (or losses).

An index fund may hold all the stocks in the index, with weights corresponding to those of the index. This involves little tracking error but can involve significant transaction costs. Alternatively a subset of the index might be used. This approach reduces transaction costs but increases tracking error.

Even if the replicating portfolio contains all the stocks in the index, appropriately weighted, there are sources of tracking error. The constituent stocks of an index are subject to change. Replacing stocks involves transaction costs. Furthermore the replacement is not instantaneous. Tracking is imperfect during the time taken to replace stocks.

Changes in the composition of an index can also affect stock prices. If index funds are widely used, stocks leaving the index will be sold in large numbers by index funds. As a result their prices fall and the funds receive unfavourable prices. Conversely stocks entering the index will be bought by index funds with the effect that their prices rise. The funds thus buy these stocks at raised prices. So the marginal stocks, those prone to move in and out of an index, are sold at low prices and bought at high prices. This weakens the performance of index tracker funds.

Murguia and Umemoto (2006) suggested that the costs of trading at unfavourable prices can be significant and that, if they avoided trading on the dates that the constituent stocks change, funds could avoid those costs. Although the costs can vary considerably the authors cited a figure of 0.19% p.a. as an amount that could be saved. By avoiding trades on the index reconstitution dates, funds could save on the effects of adverse prices but at the expense of increased tracking error. Murguia and Umemoto took the view that retail investors would be prepared to accept a little more tracking error in order to avoid the costs of trading at unfavourable prices.

Exercise 9.5

An investor has £100,000 to invest. The investor does not want to manage the investment over time.

Assuming an average dividend yield of 4% p.a. on shares, compare the net dividend yield from:

- (a) direct investment in a portfolio of shares,
- (b) investment in an actively-managed OEIC with an annual management charge of 1.5% and annual trading costs of 0.5%,
- (c) investment in an index-tracker OEIC with an annual management charge of 0.3% and annual trading costs of 0.2%,
- (d) purchase of shares in an actively-managed investment trust with an annual management charge of 0.5% and annual trading costs of 0.5%. Suppose that the investment trust sells at a 20% discount to Net Asset Value (NAV).
- (e) What other considerations would influence the choice between the investment alternatives?

Answer

- (a) The yield is 4% p.a., i.e. £4,000 p.a.
- (b) The net dividend yield on the actively managed OEIC is $4\% - 1.5\% - 0.5\% = 2\%$ p.a., i.e. £2,000 p.a.
- (c) The net dividend yield on the index-tracker OEIC is $4\% - 0.3\% - 0.2\% = 3.5\%$ p.a., i.e. £3,500 p.a.
- (d) If the investment trust discount were 20%, the share price would be $0.8 \times \text{NAV}$.

So $\text{NAV} = \text{share price}/0.8 = 1.25 \times \text{share price}$.

The dividend yield on NAV, after costs, is $4\% - 0.5\% - 0.5\% = 3\%$ p.a. The dividend yield on the investment trust shares is $3\% \times 1.25 = 3.75\%$ p.a.

The value of the dividends on NAV is 4% of £125,000, that is £5,000. From this, costs of 1% of £125,000 (i.e. £1,250) are deducted. The dividend payable to the investor amounts to £5,000 - £1,250 = £3,750. This is 3.75% of the £100,000 invested.

This is below the 4% p.a. (£4,000 p.a.) from direct investment in shares but better than the net dividend yields from the OEICs.

- (e) The advantage of the OEICs and investment trust relative to direct investment is the convenience of professionals managing the investment on the investors' behalf.

The index-tracker fund avoids management risk, which is the risk that the investment managers perform badly. This risk is present in actively managed funds. Investment trusts also suffer from the risk that the discount might increase and thereby reduce the market value of the investment.

Exchange Traded Funds (ETFs)

Exchange-traded funds are a recent innovation on stock exchanges. An institutional investor creates an exchange-traded fund by depositing a block of shares with the ETF. In return the institution receives ETF shares, which may then be sold on a stock exchange. ETFs are shares that replicate stock indices such as the FTSE 100. In other words they are index tracker funds. They are not unit trusts, investment trusts, or OEICs. Relative to unit trusts and OEICs, exchange traded funds have the advantage of being tradable at prices that continuously reflect the current value of the relevant index. Unit trusts and OEICs are bought and sold at prices that are established just once a day.

Relative to investment trusts, ETFs have the advantage of not being subject to discounts and premiums to net asset value. This is because ETFs are open-ended (like unit trusts and OEICs). Large blocks of ETF shares can be exchanged for portfolios of the underlying shares. The fact that trades can be settled using the underlying shares rather than cash serves to prevent the emergence of discounts and premiums. If discounts were to emerge they should be removed by arbitrage. Institutions could buy large blocks of ETFs at the low price and immediately exchange them for shares at a profit. So discounts should lead to large purchases that push prices up so as to eliminate the discounts. Premiums should lead to sales of ETFs as the underlying shares could be purchased at a lower price. Shares in exchange traded funds can be bought and sold through stockbrokers in the same way as any other shares. It might be noted that ETFs are open-ended with respect to large trades (and with respect to redemptions rather than the creation of ETF shares) but are closed-

ended for small investors since small investors would not be in a position to exchange large blocks of ETF shares for the underlying portfolios. Traded index securities (TRAINS) are similar to exchange-traded funds.

ETFs have two disadvantages for small investors. The first is that there may be poor liquidity; it could be difficult to find buyers and sellers (although this has not proven to be a general problem). The other is that ETFs are not useful for regular savings plans. Since each purchase entails stockbroker commissions, the cost of regular monthly purchases would be prohibitive. On the plus side, ETFs tend to have low fund management costs.

The Effects of Fund Charges

Investment managers charge fees. These fees cover the costs of investment analysis, portfolio management, marketing and administration. Sometimes the annual management charge is related to fund performance, but this is the exception rather than the norm. The payment of such charges reduces the returns to investors. The charges levied by fund managers vary considerably. In relation to unit trusts the cheapest tend to be index tracker funds (which aim to parallel a stock index). Tracker funds (index funds) typically have no front-end or exit charge and annual management charges of as little as 0.25% or 0.5%. Conversely actively managed funds tend to have initial charges of 5-7% and annual management charges of up to (and sometimes exceeding) 1.5% p.a. These differences in charges can have considerable effects on investment returns over time. (Comparison of management charges actually understates the difference in total annual costs since actively managed funds tend to trade shares more frequently and hence incur greater brokerage fees than index tracker funds.)

In addition to management charges there are stockbroker commissions. Each time that shares are bought or sold commission is paid to stockbrokers. For many funds such commissions can add well over 1% per year to the costs of operating the fund. This is particularly true for funds with high portfolio turnover (high churning). A portfolio turnover of 100% means that, on average, shares are bought and sold once a year.

Some shares would be kept for several years whilst others are held for a fraction of a year, but the average holding period is one year. The average holding period is given by:

$$\text{Average Holding Period} = \frac{12 \text{ Months}}{\text{Portfolio Turnover}/100}$$

So an annual turnover of 100% gives an average holding period of 12 months and an annual turnover of 200% implies that shares, on average, are held for six months. High rates of turnover, and low average holding periods, entail high brokerage costs. As with other costs, unless there is an offsetting improved investment performance, the costs will reduce the rate of return obtained by investors in the funds. Index tracker funds have relatively low rates of portfolio turnover, and hence low brokerage costs, compared with actively managed funds.

There are three figures commonly used for the purpose of making cost comparisons between funds. First, there is the annual management charge (AMC). Second, there is the total expense ratio (TER), which is the annual management charge plus other fees such as audit and custody fees. However TER does not necessarily include brokerage and other share dealing costs. Nor does the TER take account of initial charges. The reduction in yield (RIY) shows the effect of the TER costs, plus any initial or exit charges, on the percentage yield from the investment. The calculated RIY is very sensitive to the assumed period of investment. The normal practice is to assume a ten-year investment. Shorter investments have higher RIYs since the initial (and/or exit) charge would be spread over a smaller number of years. Conversely longer investments have lower RIYs. If published RIYs are based on ten-year investments, they can be misleading for investors with different investment horizons.

Consider the investment of £1,000 in each of fund A and fund B. Suppose that the investments in both funds grow at an average of 7% p.a. in real terms (that is, in excess of what is needed to compensate for inflation). This growth rate is in line with historical experience of equity funds and incorporates both capital gains and net dividend income. The figure of 7% p.a. does not take account of management charges.

Suppose that A is an index tracker fund with no front-end charge and an annual management fee of 0.5%. All of the investors' money is invested and the charge reduces the average annual return to 6.5%. Suppose that B is an actively managed fund with a front-end charge of 6% and an annual management fee of 1.5%. Such a fund would also experience transaction costs from share dealing. If half the fund is traded each year at an average bid-offer spread of 1%, annual costs would increase by a further 0.5% to a total of 2%. An investor in B would find that only £940 is invested and that average annual returns, net of costs, are 5%. Table 9.1 shows the expected value of the two funds over various time periods.

Investment Horizon	A	B
5 years	£1,370	£1,200
10 years	£1,877	£1,531
15 years	£2,572	£1,954
20 years	£3,524	£2,494
25 years	£4,828	£3,183
30 years	£6,614	£4,063

Table 9.1

The transaction costs of the actively managed fund are likely to be even higher than 0.5% p.a. since brokerage fees and taxes (stamp duty) need to be added.

Another way of looking at the effects of fund charges is to consider the situation of an investor who is holding an investment for the purpose of providing an income (for example to supplement a pension). Consider the holder of a fixed-income (i.e. bond) unit trust. If the bond portfolio held by the unit trust yields 5% p.a. and fund charges are 1.25% p.a., the investor loses a quarter of the income to fund charges. It would be worth considering the possibility of holding bonds directly. This possibility may be attractive in the light of the lower risk-reduction benefits of diversification in the case of bonds (particularly government

bonds) when compared to shares. Besides government bonds can be bought in relatively small quantities quite cheaply through post offices (in the UK).

Reichenstein (1999) examined bond fund returns in the US for the period 1994-1998 and found a strong inverse relationship between expenses and net returns. Low-cost funds consistently ranked among the best over the five-year period. The negative relationship between expenses and net returns was virtually one-to-one, suggesting that investors obtained no benefits from the payment of high charges. Any increment in expenses was at the cost of reduced net returns for investors.

Exercise 9.6

A fund has a prospective average growth rate of 8% p.a. over the next 35 years. Estimate the fund value, at the end of the 35 years, arising from a £10,000 investment in the fund with (a) no initial charge and a 0.5% annual charge, (b) no initial charge and a 1.5% annual charge, and (c) a 5% initial charge and a 1.5% annual charge.

Answer

$$(a) \quad £10,000 \times (1.075)^{35} = £125,689$$

(The figure of 1.075 is used because the net rate of return is expected to be $8\% - 0.5\% = 7.5\%$ p.a. The value of $(1.075)^{35}$ can be calculated using the power function of a pocket calculator.)

$$(b) \quad £10,000 \times (1.065)^{35} = £90,623$$

$$(c) \quad £9,500 \times (1.065)^{35} = £86,091$$

Exercise 9.7

You are considering an investment of £10,000 in a mutual fund for the purpose of adding to your retirement income. You expect to retire 40 years from now. You are choosing between an index tracker fund and an

actively managed fund. The index tracker fund has no initial charge, an annual management charge of 0.3% of the value of the fund, and average annual share dealing costs of 0.2%. The actively managed fund has an initial charge of 5% of the value of the investment, an annual management charge of 1.5% of the value of the fund, and average annual share dealing costs of 1%. You have read that over the long term the average real rate of return on a balanced portfolio of shares has been 6% p.a. You expect that performance to continue for the next 40 years. On the assumption that the funds match the general market performance:

- (a) What do you expect the value of the index tracker fund to be after 40 years?
- (b) What do you expect the value of the actively managed fund to be after 40 years?

Answer

- (a) The expected real rate of return on the index tracker fund, net of management charges and share dealing costs, is $6\% - 0.3\% - 0.2\% = 5.5\%$ p.a. The expected value of a £10,000 investment after 40 years is:

$$£10,000 \times (1.055)^{40} = £85,133.09$$

- (b) The expected real rate of return on the actively managed fund, net of management charges and share dealing costs, is $6\% - 1.5\% - 1\% = 3.5\%$ p.a. Net of the initial charge the investment amounts to £9,500 (95% of £10,000). The expected value of the investment after 40 years is:

$$£9,500 \times (1.035)^{40} = £37,612.97$$

Exercise 9.8

You are considering an investment of £10,000 in a mutual fund for the purpose of adding to your retirement income. You expect to retire 40 years from now. You are choosing between an index tracker fund and an actively managed fund. The index tracker fund has no initial charge, an annual management charge of 0.5% of the value of the fund, and other costs (including brokerage fees) amount to 0.3% p.a.. The actively managed fund has an initial charge of 5% of the value of the investment, an annual management charge of

1.5% of the value of the fund, and other costs (including brokerage fees) amount to 1.1% p.a. of the value of the fund. You have read that over the long term the average real rate of return on a balanced portfolio of shares has been 6% p.a. You expect that performance to continue for the next 10 years. On the assumption that the funds match the general market performance:

- (a) What is the annual total expense ratio (inclusive of brokerage fees) in each case?
- (b) What do you expect the value of the index tracker fund to be after 10 years?
- (c) What are the effects of expenses on the expected average annual return of the tracker fund?
- (d) What do you expect the value of the actively managed fund to be after 10 years?
- (e) What are the effects of expenses on the average annual return of the actively managed fund?
- (f) What would be the effects of charges on the expected average annual returns of each fund if the investment horizon were five years rather than ten years?

Answer

- (a) The annual Total Expense Ratio for the tracker fund is $0.5\% + 0.3\% = 0.8\%$. For the actively managed fund it is $1.5\% + 1.1\% = 2.6\%$.
- (b) The expected real rate of return on the index tracker fund, net of expenses, is $6\% - 0.8\% = 5.2\%$ p.a. The expected value of a £10,000 investment after 10 years is:

$$£10,000 \times (1.052)^{10} = £16,601.89$$

- (c) Expenses reduce the expected annual return on the tracker fund from 6% to 5.2%. There is a reduction in yield (RIY) of $6\% - 5.2\% = 0.8\%$ p.a.
- (d) The expected real rate of return on the actively managed fund, net of management charges and share dealing costs, is $6\% - 2.6\% = 3.4\%$ p.a. Net of the initial charge the investment amounts to £9,500 (95% of £10,000). The expected value of the investment after 10 years is:

$$£9,500 \times (1.034)^{10} = £13,271.78$$

- (e) The expected average annual return on the actively managed fund is:

$$(13,271.78/10,000)^{0.1} - 1 = 0.0287 \text{ i.e. } 2.87\%$$

The effect of expenses is to reduce the expected average annual return from 6% to 2.87%. The reduction in yield (RIY) is $6\% - 2.87\% = 3.13\%$ p.a.

- (f) If the investment horizon were five years, the expected average annual return from the index tracker fund would still be 5.2%.

The expected value of the actively managed fund after five years would be:

$$£9,500 \times (1.034)^5 = £11,228.62$$

The average annual rate of return would be:

$$(£11,228.62/£10,000)^{0.2} - 1 = 0.0234 \text{ i.e. } 2.34\%$$

The effect of expenses is to reduce the expected average annual return from 6% to 2.34%. The reduction in yield (RIY) is $6\% - 2.34\% = 3.66\%$ p.a. The reduction is greater than in the case of the ten year investment horizon because the initial charge of 5% is spread over a smaller number of years.

N.B. The RIY figures quoted by fund managers do not take account of share dealing costs such as brokerage fees and taxes. It is possible for brokerage costs to exceed 1% of the value of the fund per year. In the UK there is a 0.5% tax (known as stamp duty) on share purchases. This tax raises share-dealing costs.

Exercise 9.9

Suppose that it is observed that the long-term real rate of return on the stock market, net of tax, has been 6% p.a. and an investor believes that the return will be the same in the future. If the investor invests £1,000 in an OEIC fund with a view to leaving the money invested for forty years, allowing net dividends to be invested, what would be the expected future value of the investment if it were invested:

- (a) In an actively-managed fund with an initial charge of 5%, an annual management fee of 1.5% of the value of the fund, other annual charges of 0.2%, and annual stock broking fees of 1%.
- (b) In an index-tracker fund with no initial charge, an annual management fee of 0.1% of the value of the fund, other annual charges of 0.2%, and annual stock broking fees of 0.1%.

Assume that the expected annual return, before charges, is the same for both funds.

- (c) Is this a reasonable assumption?
- (d) A fund of funds is a portfolio of OEICs/Unit Trusts. The fund manager buys and sells OEICs/Unit Trusts in an attempt to be invested in the most successful funds at any time. An additional management fee is charged by the manager of the fund of funds. If the manager of the fund of funds charges 1.5% p.a., and the charges of the component funds are as indicated in (a) above, what would be the expected future value of £1,000 invested for forty years if the manager of the fund of funds does not, on average, identify the most successful funds? (Assume that the initial charge is paid only when the first investment is made, and is not repeated each time that funds are switched.)

Answer

(a) The initial charge of 5% would reduce the sum invested to $£1,000 \times (1 - 0.05) = £950$. The total annual cost of operating the fund is $1.5 + 0.2 + 1 = 2.7\%$ of the value of the fund. This reduces the expected real return to $6 - 2.7 = 3.3\%$ p.a. The expected future value of the investment would thus be:

$$£950 \times (1.033)^{40} = £3,481.26$$

(b) The full £1,000 would be invested. The total annual cost of operating the fund is $0.1 + 0.2 + 0.1 = 0.4\%$ of the value of the fund. This reduces the expected real return to $6 - 0.4 = 5.6\%$ p.a. The expected future value of the investment would be:

$$£1,000 \times (1.056)^{40} = £8,842.13$$

(c) The assumption that the expected annual return, before charges, is the same for both funds is reasonable if it were the case that the actively managed fund fails to produce consistent out-performance of the stock market. If the active fund management were to succeed in enhancing returns by more than an average of $2.7 - 0.4 = 2.3\%$ p.a., the actively managed fund would prove to be superior to the index-tracker fund. The Efficient Market Hypothesis suggests that actively managed funds will not consistently beat the stock market, even before charges are considered. The empirical evidence suggests that any average out-performance from actively managed funds is unlikely to exceed the effect of fund charges.

(d) The expected real return in (a) is further reduced to $3.3 - 1.5 = 1.8\%$ p.a. The expected future value of the investment would thus be:

$$£950 \times (1.018)^{40} = £1,939.25$$

A fund-of-funds is a unit trust, OEIC or investment trust that invests in other collective investments. For example a unit trust that invests in other unit trusts and OEICs. It should be borne in mind that whilst the investor in a fund-of-funds gains from two layers of fund management if the fund management is successful, underperformance could be compounded if the fund management were poor. Two layers of charges would be payable. Charges are payable to the manager of the fund-of-funds and to the managers of the funds held within the fund-of-funds. So the total amount of charges may be high. Exhibit 9.2 provides an example of a fund-of-funds.

EXHIBIT 9.2

It is possible to hold investment trust shares within a unit trust or OEIC. This exhibit provides an example.

M&G Fund of Investment Trust Shares

Fund objective

The portfolio is normally limited to shares of investment trust companies. These shares provide a wide spread of investment in the UK and overseas stockmarkets and are often available at substantial discounts in relation to underlying asset values. Income is not a major factor, and the yield can be expected to be slightly less than the average for investment trust companies.

Fund Size: £37.74 million (28/09/07)

Initial Charge: 4%

Annual Charge: 1%

Largest Ten holdings, as percentages of the fund (30/06/07)

Merrill Lynch World Mining Trust	5.54%
Advance Developing Markets Trust	4.85%
Scottish Mortgage Investment Trust	4.19%
Dolphin Capital Investors Ltd	3.96%
Real Estate Opportunities Ltd	3.87%
Fidelity European Values	3.57%
The Monks Investment Trust	3.04%
Aberdeen Asian Income Fund Ltd	2.64%
TR Property Investment Trust	2.62%
Hansa Trust	2.52%

TABLE 9.D

Source: M&G Securities Limited

Charges, Commission and Factory Gate Pricing

One factor that increases the level of charges is the payment of commission to the financial adviser who recommends the investment product to a customer. The adviser would receive a percentage of the money invested; in the case of a unit trust this might be 3%. This percentage is part of the initial charge on purchases. There is often a trail commission, which is a sum paid to the adviser each year that the investment is held by the customer. This might be 0.5% of the value of the investment, and is part of the annual charge on the fund. Paying advisers by means of commission is very controversial, and leads to the suspicion that advisers often recommend investments that pay high commissions rather than investments that are best for the customer. Some evidence that commission affects the recommendations of financial advisers comes from research by Jones, Lesseig and Smythe (2005).

The controversial nature of commission-based advice was highlighted by the House of Commons Treasury Committee (2004):

“In the Committee’s view it seems likely that as long as most of the selling activity in the long-term savings industry is rewarded on a commission basis, many savers may remain suspicious that they are being sold a product for the wrong reasons. Shifting away from the current commission-based sales system common in much of the industry is likely to be a key component of any strategy to rebuild consumer confidence in the industry after the long catalogue of mis-selling scandals in recent years.”

“For IFAs to receive trail commission whether or not they are providing any real on-going advice to the client is unacceptable. The persistence of this practice is a clear sign that the market for financial advice is not working in the best interests of consumers. “

An alternative to paying for financial advice indirectly via fund charges (and thereby commission) is for the customer to pay the adviser directly by means of a fee. An irony is that commission-based advisers often advertise their advice as being “free”, despite the fact that indirect payment by the customer via fund charges is often more expensive than paying a fee to the adviser.

Harris (2007) cited an opinion poll, which indicated that only one-third of consumers of financial products believed personal financial advisers to be trustworthy. This was accompanied by a report of the view that the fact that producers of financial products (financial institutions) pay financial advisers to sell those products (via commission) creates problems concerning the way consumers (clients) view financial advisers. Harris suggested a ‘factory gate pricing’ approach to the payment of advisers (the suggestion was made in relation to investment bonds, but is applicable to other financial products such as unit trusts and OEICs). Factory gate pricing by the producer would entail an annual management charge (and possibly an initial charge) but would not incorporate any element of cost to cover payments to advisers. Payment would be directly from consumer to adviser, and not from producer to adviser. Payments would be agreed between the adviser and the consumer.

The payment could take one or more of a number of forms such as a percentage of the sum invested being paid to the financial adviser (equivalent to initial commission), an annual charge payable to the adviser (equivalent to trail commission), or a single payment specified in money terms (which may be related to the number of hours of work carried out by the adviser). This factory gate pricing approach should make the charging structure more transparent to the consumers of financial products. It might also make advisers more likely to recommend products that do not pay commission, such as investment trusts and money market investments. Such a broadening of the range of constituent investments could result in the recommended portfolio being more closely tailored to the needs of the consumer. However so long as commission-based advisers continue to promote their services as free, the less sophisticated consumers are likely to choose them in preference to advisers who are transparent about their charges.

Are Investors Deterred by High Charges?

For most goods and services consumers prefer to pay low prices. The question arises as to whether this is also the case for mutual funds. Do retail investors prefer to invest in funds with low charges? It may be the case that retail investors do not appreciate the impact of charges on the long-term performance of mutual funds.

Barber, Odean and Zheng (2005) investigated this issue in the US. They found that investors were deterred by initial charges (front-end loads) but not by high annual charges. They found that initial charges were associated with lower demand, particularly from experienced investors. However investors, even experienced investors, appeared to be unaffected by the level of annual charges. This implies that mutual fund managers are able to raise annual charges without adversely affecting the sales of their funds.

This may help to explain the increase in annual charges over time. Bogle (2005) reported that, in the US, the six decades after 1945 experienced nearly a doubling of charges as a proportion of the value of funds. This is despite strong economies of scale in mutual fund management as found by Latzko (1999).

Latzko took the view that mutual fund charges could be divided into three major categories. There are fees paid to investment managers. These fees normally rise less than proportionately to the increase in fund size. The second category is administrative expense, which can also be expected to rise less than proportionately to the size of the fund. The third category is the cost of marketing, which need not rise in proportion to the size of funds under management. Latzko found that the cost of operating mutual funds rose at a slower rate than the size of the funds.

The implication seems to be that retail investors do not appreciate the impact of fund charges on investment performance. In consequence retail investors are prepared to pay high charges, and the mutual fund industry has taken advantage by raising charges. Barber, Odean and Zheng took the view that investors undergo a learning process. Although many have learned to avoid initial charges, few have learned to avoid high annual charges (which can be avoided by investing in low-cost index-tracker funds).

Ivkovic and Weisbenner (2009) found that, rather than deterring investors, both high front-end charges and high annual charges appeared to be associated with high inflows of new money into a fund. The authors provided evidence that this was explicable in terms of two relationships. One was high advertising expenditure associated with high charges. The other was the relationship between perceived management quality and high charges, although this effect could have arisen from good past performance attracting inflows together with charges being raised to take advantage of the situation. High annual charges were associated with an increased likelihood that investors would sell funds, although high front-end charges appeared to deter sales. This effect of front-end charges could be the result of sunk costs influencing decisions (an irrational behaviour identified by behavioural finance).

The Effects of Taxation on Investment Returns

Taxation has a considerable effect on the returns to an investment. Table 9.2 illustrates the outcome of a lump sum investment of £1,000 over investment horizons of 10 years, 20 years, and 30 years. It is assumed that the value of the investment grows at an average of 8% p.a.

Period of Investment	10 years	20 years	30 years
Tax Deductible Investment (at 40% Tax) plus Tax Free Accumulation	£3,598 (13.66%)	£7,768 (10.79%)	£16,771 (9.85%)
Tax Free Accumulation	£2,159 (8%)	£4,661 (8%)	£10,063 (8%)
Deferred Tax at 24%	£1,880 (6.52%)	£3,782 (6.88%)	£7,888 (7.13%)
Deferred Tax at 40%	£1,695 (5.42%)	£3,197 (5.98%)	£6,438 (6.4%)

Annual Taxation at 40%	£1,598 (4.8%)	£2,554 (4.8%)	£4,082 (4.8%)
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Table 9.2

The first row shows the outcome of an investment that is tax deductible and accumulates tax free. If the investment is tax deductible then the sum actually invested, as the result of an outlay of £1,000, is $£1,000/0.6 = £1,667$. (If an investment of £1,667 could be deducted from income for tax purposes, a 40% tax payer would enjoy a £667 reduction in income tax liability. So the investment, net of tax relief, would cost £1,000.) The sums of money shown are the values of the investment at the end of the respective periods. The percentages in parentheses show the (average compound per annum) rates of return.

The second row shows the outcome of an investment that is not tax deductible but which is allowed to accumulate free of tax. The third row shows the results of an investment that is free of tax during the life of the investment but which is subject to tax at 24% on investment returns when the investment is liquidated. The fourth row is similar to the third row except that the tax rate is 40%. The fifth row shows the outcomes when the investment returns are taxed each year.

It can be seen that the tax treatment makes a considerable difference. For example the 30-year outcome with the most favourable tax treatment is more than four times the outcome with the least favourable treatment. In the UK pension funds are highly favoured investments, in terms of tax treatment. Pension contributions are tax deductible, pension funds are free of capital gains tax, interest and bond coupon receipts are tax free, and dividends from shares receive favourable tax treatment (from the perspective of payers of the 40% tax rate).

Individual Savings Accounts (ISAs) and Personal Equity Plans (PEPs), whilst not being tax deductible, do receive favourable tax treatment. Such investments are free of capital gains tax, interest and bond coupons are tax free, and dividends from shares receive favourable tax treatment (from the perspective of payers of the 40% tax rate).

In the UK capital gains tax is payable only when investments are sold, in other words the tax is deferred. Furthermore the rate of capital gains tax is lower than the rate of income tax (24% as against 40% if the investment is held for ten years or more). So investments that provide returns in the form of capital gains are more favourably treated than investments whose returns are in the form of periodic payments such as interest, coupons, or dividends. This means that shares are treated more favourably than bonds and bank (and building society) deposits since shares produce more of their return in the form of capital gains.

These conclusions are applicable to payers of the standard rate of tax as well as to those who pay the higher (40%) rate. The relative advantage of shares is further reinforced by the fact that the first £9,200 (the figure at the time of writing) of capital gains in any financial year is free of tax.

Exercise 9.10

A unit trust fund has a prospective average annual return of 7.5% over the next 25 years. Estimate the value of a £1,000 investment after 25 years when the returns are (a) tax free, (b) subject to a deferred tax (i.e. taxed at the end of the 25 years) of 20%, and (c) subject to an annual tax of 20%.

Answer

(a) $£1,000 \times (1.075)^{25} = £6,098$

(b) $\{ (£6,098 - £1,000) \times 0.8 \} + £1,000 = £5,078$

(The investor retains 80% of the accumulated return plus the initial investment of £1,000)

(c) $£1,000 \times (1.06)^{25} = £4,292$

(The annual tax of 20% turns a 7.5% p.a. return into a 6% p.a. return since $0.8 \times 7.5 = 6$, and 0.8 is the portion that the investor retains after tax.)

Exercise 9.11

Suppose that an investor anticipates an (annual) income tax rate of 40%, and a (deferred) capital gains tax rate of 20%. What would be the final value of an investment of £1,000 for ten years under the following circumstances?

- (a) The investment yields an average of 6% p.a. entirely in dividends.
- (b) The investment yields an average of 6% p.a. entirely in price rises.

Answer

- (a) The yield after income tax is $6 \times (1 - 0.4)\% = 3.6\%$ p.a.

$$(1.036)^{10} = 1.42429$$

$$1.42429 \times \text{£}1,000 = \text{£}1,424.29$$

- (b) The value of the investment, after ten years, before tax is deducted is:

$$(1.06)^{10} \times \text{£}1,000 = 1.79085 \times \text{£}1,000 = \text{£}1,790.85$$

The capital gains tax to be paid is:

$$\text{£}790.85 \times 0.2 = \text{£}158.17$$

The investment, after capital gains tax, amounts to:

$$\text{£}1,790.85 - \text{£}158.17 = \text{£}1,632.68$$

It is to be noted that although the investment of part (b) yields the same pre-tax total return, as that of part (a), it provides the higher post-tax value at the end of ten years. That is because the return in the case of (b) is in the form of capital gains, which are relatively lightly taxed.

Exercise 255

You have £10,000 to invest for a period of 40 years. The chosen investment fund has a prospective average annual yield of 6% p.a. net of charges.

- (a) What would be the expected final value of the investment in the absence of any taxes?
- (b) What would be the expected outcome with a 40% annual tax but no deferred gains tax?
- (c) What would be the expected final value with no annual tax but a 40% deferred gains tax?

Discuss the results.

Answer

(a) The expected final value is: $£10,000 \times (1.06)^{40} = £102,857.18$

(b) A 40% income tax would reduce the annual return to $6 \times 0.6 = 3.6\%$ p.a.

The expected final value is: $£10,000 \times (1.036)^{40} = £41,151.93$

(c) In the absence of any tax the gain would be $£102,857.18 - £10,000 = £92,857.18$.

Capital gains tax would be:

$£92,857.18 \times 0.4 = £37,142.87$.

The expected final value would be:

$£102,857.18 - £37,142.87 = £65,714.31$

The total return on stocks is a combination of dividends and increases in stock prices. In the UK dividends are subject to income tax (which is an annual tax) and increases in stock prices are subject to capital gains tax (which is a deferred tax).

If income tax rates and capital gains tax rates were equal, there would be an advantage from receiving returns in the form of price increases rather than dividends. Companies can distribute money to shareholders either by paying dividends or by buying back shares. Share buybacks tend to raise stock prices. The relative levels of income tax and capital gains tax would affect the relative merits of dividends and share buybacks.

Exercise 9.12

You have £5,000 to invest for a period of forty years. The chosen investment fund has a prospective yield of 6% p.a., of which 3% p.a. is from dividends and 3% p.a. from capital gains. If the government introduces a tax-advantaged investment scheme with 20% income tax and no capital gains tax, what would you expect the value of the fund to be after forty years?

Answer

After income tax at 20%, the rate of dividend yield is $3 \times (1 - 0.2) = 2.4\%$ p.a. The total rate of return is therefore $3 + 2.4 = 5.4\%$ p.a. The value of the investment after forty years is:

$$£5,000 \times (1.054)^{40} = £5,000 \times 8.196424 = £40,982.12$$

Individual Savings Accounts (ISAs)

ISAs were introduced in the 1999 Finance Act and are due to have unlimited lives. They provide tax-advantaged investments. As of 6 April 2008, up to £3,600 per year could be invested in a cash ISA with a bank, building society or other deposit taker. The interest on the cash is tax-free and the money can be withdrawn at any time without loss of the tax relief (although if the money is withdrawn subsequent to the financial year in which the investment was made, it cannot be reinvested in that year's ISA).

Up to £7,200 (minus any amount invested in a cash ISA) could be invested in a stocks and shares ISA. The investment could be in the form of collective investments such as unit trusts, investment trusts, open-ended investment companies (OEICs), and life assurance funds. Alternatively (or additionally) the investment could be in direct holdings of shares or bonds.

Stocks and shares ISA investments are free of capital gains tax and bond coupons are free of income tax. Investors receive a tax credit on bond coupons. At the time of writing UK investors in bonds are treated as having paid a 20% tax on bond coupons and this implied tax is reclaimable, by the ISA manager, from the Inland Revenue. The reclaimed tax is paid to the ISA investors in the form of tax credits added to their ISA accounts. In the case of equity investments (either direct shareholdings or collective investments in shares)

no tax is payable on dividends but there is no tax credit to be reclaimed. Higher-rate taxpayers avoid the additional tax on dividends that arises from being higher-rate taxpayers, but there is no income tax advantage for basic-rate taxpayers.

Cash ISAs, and stocks and shares ISAs, can either be with two different providers (the providers include banks, building societies, insurance companies, and investment companies) or with the same provider. There is a facility to switch from a cash ISA to a stocks and shares ISA, but not in the opposite direction. Investments can be withdrawn at any time without loss of the tax advantages. An investor may choose different providers for ISAs in successive years.

CAT-marking

'CAT' stands for Charges, Access, and Terms. CAT standard investments must have low charges, provide easy access, and be subject to fair terms. ISAs that bear the CAT label must abide by a set of rules. In the case of stocks and shares ISAs there should be a maximum annual management charge of 1% (in the case of life assurance funds this is 3%), regular saving must be possible at £50 per month (£25 for life assurance funds), and lump sum investments of £500 allowed (£250 for life assurance funds). In the case of cash ISAs, the CAT label implies easy withdrawal of small sums at short notice. Interest rates on cash ISAs are also required to follow changes in market interest rates without significant delay. Stakeholder savings plans and Child Trust Funds can be held in an ISA and they replicate CAT standards (although management charges can be up to 1.5% p.a.).

Self-select ISAs

Self-select ISAs offer high flexibility. Instead of choosing between funds offered by a single investment manager, the holder of a self-select ISA can hold funds from several different investment managers. Self-select ISAs also provide the facility of investing directly in shares and bonds. Self-select ISAs are sold by stockbrokers and by firms of financial advisers. There will be charges to be paid to the plan operator (charges that are additional to those of the funds held within the ISA) whereas holding ISAs operated by individual investment managers (packaged ISAs) usually avoids the additional layer of charges.

It is possible to take out a self-select ISA with a discretionary service. With a discretionary service the stockbroker (or financial adviser) takes the investment decisions. With an advisory service the investor receives advice from the stockbroker but the investor takes the decisions. With an execution-only service the investor takes the decisions and the stockbroker merely follows the investor's instructions.

Fund Supermarkets

Fund supermarkets allow an investor to invest across a range of investment managers within a single ISA. It is also possible to operate through a fund supermarket when investing in collective investments outside an ISA. A fund supermarket is a form of wrap account.

Wrap accounts are online platforms that allow investors to see their full range of investments in one place. They also provide valuations of the investment totals. Liabilities may also be included. A fund supermarket can be seen as a wrap account that is limited to collective investments. Those collective investments could be inside ISAs, inside pension plans, or outside both and could include unit trusts, OEICs, investment trusts, life assurance funds (investment bonds), and Exchange Traded Funds.

Venture Capital Trusts (VCTs) and Enterprise Investment Schemes (EISs)

VCTs and EISs are UK schemes that encourage investment in small companies. The encouragement is through the provision of tax breaks. At the time of writing Venture Capital Trusts had been the more successful in attracting investors.

Venture Capital Trusts are similar to investment trusts. A VCT holds a portfolio of shares of unquoted companies and/or companies listed on the Alternative Investment Market (AIM), which is the junior stock exchange in the UK. These companies are new and/or small enterprises that are too new and/or too small to have their shares listed on the main stock exchange (that is to have their shares traded on the main stock exchange). Since April 2006 the maximum size of a company that qualifies for VCT funding has been £7

million of gross assets (previously it was £15 million). The VCT has a stock exchange listing and is professionally managed by a fund manager.

Like investment trusts, the market value of a VCT usually differs from the sum of the values of its investments in companies. VCTs often trade at a discount to their net asset values. Since the market for VCTs tends to be illiquid, sales of VCTs are likely to involve large discounts to underlying value. The fact that the tax breaks apply only to investment in new issues, and not to the purchase of existing VCTs, also makes large discounts likely.

The companies owned by a VCT may trade at a discount to fundamental value. Podolny (2001) provided an explanation for possible discounts on the values of companies included in VCTs. A distinction was made between altercentric risk and egocentric risk. Altercentric risk relates to uncertainty about the outcome of investments. Egocentric risk concerns the possibility that the company managements may be untrustworthy. Very small companies may be subject to relatively high egocentric risk because their managements are relatively unknown.

Investments in a VCT attract tax relief at 20% up to the investment ceiling of £100,000 per year.

Investments are also free of income tax and capital gains tax. All dividends from a VCT are free from income tax. No capital gains tax is payable on gains made on the sale of VCT shares. VCTs can distribute realised capital gains tax-free as enhanced dividends. These tax breaks are subject to minimum holding periods (which can be as low as three years). A further tax concession relates to the facility of sheltering capital gains from other sources. Capital gains from other sources are sheltered from tax if they are invested in a VCT. The capital gains tax is not payable until the VCT investment is sold.

The tax advantages of VCTs tend to be variable. For example for a two-year period, 2004 to 2006, the tax rules were changed. The tax relief was raised to 40% for most investors. The investment ceiling for these tax breaks was raised from £100,000 to £200,000 per year. However the facility of sheltering capital gains

from other sources was removed. For the 2006-07 tax year the maximum tax relief was lowered to 30%, but otherwise the tax rules were the same as those for the 2004 to 2006 period.

Venture capital investment in a company is usually for a limited period, typically 5 to 10 years. The investment is often accompanied by the provision of some managerial expertise. The company (VCT) that provides the capital looks towards making a capital gain from selling its stake in the enterprise to another investor (possibly through a takeover) or from selling shares following a stock market flotation. Venture capitalists also fund MBOs (Management Buy-Outs). MBOs entail the purchase of a company by its existing management.

Enterprise Investment Schemes involve the investment being made in a single unquoted company rather than a portfolio of companies. Unlike VCTs, EIS investments do not have an upper limit to the annual investment. However only the first £200,000 per year attracts the tax concessions of 20% relief plus freedom from capital gains tax. The whole of the investment can be used to shelter capital gains from other sources. Capital gains from other sources are not taxable until the EIS investment is sold. The EIS tax concessions may also be applicable to investments in AIM (Alternative Investment Market) quoted companies, where shares are being issued to raise capital for investment. EIS investments are likely to be less liquid than VCTs since EISs are not stock exchange listed and hence cannot be sold through a stock exchange.

Pound Cost Averaging

Pound cost averaging refers to an advantage of buying unit trusts (or other institutional investments) on a regular basis. More units are bought at low prices than at high prices so that the average purchase price is less than the average price of units.

Suppose that a monthly investment of £150 is made for 3 months during which the price per unit is 75p for 1 month, 100p for 1 month, and 125p for 1 month. (So the average price is $[75 + 100 + 125]/3 = 100p$.)

When the price is 75p, $150/0.75 = 200$ units are bought. At 100p, $150/1 = 150$ units are acquired. At 125p, 120 are received. The total is 470 units.

If the whole £450 were spent on units at the average price of 100p, 450 units would be acquired. Monthly investing led to 20 more units.

There is no option of buying at the average price since the average price is not known until the end of the investment period. For an investor who has no choice as to whether the investment is spread out over time, or made initially as a lump sum, the ability to pay a lower price than the average price experienced is a bonus. For an investor with a lump sum to invest the fact that pound cost averaging achieves a lower average purchase price has no significance for deciding between investing the lump sum immediately or investing it gradually over time. The choice is not between investing at the average price and spreading the investment, it is between investing at the initial price and spreading the investment.

An advantage of investing on a periodic basis, rather than investing the whole sum at a single point in time, is that there is some time-diversification. When investing at a single point in time there is a risk that the shares or units would be bought at their highest price. Although it may be that the purchase occurs at the lowest price, it is impossible to know when prices are low until after the event. Single lump-sum investments bear the risk that purchases are made at high prices. By investing on a periodic basis, ups and downs are smoothed out with the result that the average purchase price avoids the extreme values. In other words, risk is reduced by time-diversification (in the sense of diversification of the timing of investments).

Bogle (2008) illustrated the risks faced by an investor making all investments at a single point in time. He pointed out that, between 1950 and 2007, the S&P Index of US stocks had increased from 17 to 1,470 but removing the best 40 days would have reduced the new value to 288. Conversely removal of the worst 40 days would have raised the final level to 11,550. This illustrates the potential effects of investing just before large falls, or of missing large rises. Stock market movements can be sudden and dramatic. Pound cost averaging greatly reduces the risk of unfortunate timing.

Lump sum investing bears the risk that the investment is made when prices are high. The chapters dealing with behavioural finance indicate that investors often buy after the market has risen. Emotional factors and psychological biases tend to cause people to invest when prices are high. Pound cost averaging takes the emotion and adverse psychology out of the investment process.

When compared with investing an initial lump sum, the gain from pound cost averaging has to be weighed against the returns from the unit trust over the relevant period. Monthly investment involves a delay in investing that entails foregoing some of the returns from the units. Williams and Bacon (1993) considered the choice between investing an entire lump sum immediately and spreading the investment over twelve months. Based on a 65-year period they found that investing the entire lump sum immediately proved to be the better strategy about two-thirds of the time.

Abeysekera (2000) pointed out that if, on average, the return on stocks exceeds interest rates the immediate investment of a lump sum would have an advantage in terms of expected return. In consequence the immediate investment approach should produce the higher return in most cases, albeit at the cost of higher risk. Spreading the investment over time entails less receipt of stock returns and more receipt of interest. If stock returns exceed interest rates, the result will be lower overall returns. The conclusion is that the investor has a decision based on a risk-return trade-off. Immediate investment is expected to provide higher returns but higher risk. Periods of high interest rates might favour the pound cost averaging approach if the excess of stock returns over interest rates is correspondingly reduced.

Exercise 9.13

The prices of a unit trust at the end of each of 12 successive months are:

50p, 40p, 50p, 60p, 50p, 70p, 65p, 80p, 75p, 60p, 80p, and 100p.

How does a regular monthly investment of £100 compare with investing the whole £1200 at the average unit price (in terms of the value of the investment at the end of the twelve months)?

Answer

The average unit price is 65p. Spending £1200 at 65p buys $1200/0.65 = 1846.15$ units, which are worth £1846.15 at the end of the year.

Spending £100 per month acquires:

$$100/0.5 + 100/0.4 + 100/0.5 + 100/0.6 + 100/0.5 + 100/0.7 + 100/0.65 + 100/0.8 + 100/0.75 + 100/0.6 + 100/0.8 + 100/1.0$$

$$= 200 + 250 + 200 + 166.67 + 200 + 142.86 + 153.85 + 125 + 133.33 + 166.67 + 125 + 100$$

= 1963.38 units, which are worth £1963.38 at the end of the year.

Exercise 9.14

The prices of shares in an OEIC at the end of six successive months were:

125p, 100p, 150p, 75p, 125p, and 175p

- What was the average (end of month) price of the shares?
- How many shares could be bought with £1500 at the average price?
- What would the resulting shareholding be worth at the end of the six-month period?

Suppose that an investor spread the £1500 investment evenly over the six months in order to benefit from pound cost averaging (investing £250 at the end of each month).

- How many shares were bought?
- What was the average price of the shares bought?
- What was the value of the resulting shareholding at the end of the six-month period?
- Comment on the results.

Answer

(a) $(125 + 100 + 150 + 75 + 125 + 175) / 6 = 125\text{p}$

(b) $£1500 / £1.25 = 1200$ shares.

- (c) $1200 \times \text{£}1.75 = \text{£}2,100$.
- (d) $\text{£}250/\text{£}1.25 + \text{£}250/\text{£}1 + \text{£}250/\text{£}1.50 + \text{£}250/\text{£}0.75 + \text{£}250/\text{£}1.25 + \text{£}250/\text{£}1.75$
 $= 200 + 250 + 166.67 + 333.33 + 200 + 142.86 = 1292.86$ shares.
- (e) The average price of the shares bought through monthly investment is $\text{£}1500/1292.86 = 116\text{p}$.
- (f) $1292.86 \times \text{£}1.75 = \text{£}2,262.51$.
- (g) As a result of the pound cost averaging, more shares are bought at low prices than at high prices. In consequence the average purchase price of the shares is less than the average (end of month) price: 116p as opposed to 125p. Correspondingly the number of shares bought through monthly investment is greater than the number that could have been bought at the average price: 1292.86 as opposed to 1200.

Investing all the money at the lowest price would be ideal, but it is not possible to know the lowest price until the end of the investment period (by which time the opportunity to buy at the lowest price has gone).

An advantage of spreading the investment over time is that there would be a tendency for low prices to offset high prices thereby removing the risk that the whole investment is made at a high price (this is time diversification).

Dilution Levies, Dilution Adjustments and Fair Value Pricing

Open Ended Investment Companies (OEICs) have a single published price. In principle buyers and sellers face the same price (unlike unit trusts in which the buying price is higher than the selling price). However the underlying securities (typically company shares) do not have single prices. The price of the OEIC is based on the mid-prices of the shares held in the fund. The mid-prices lie halfway between the offer and bid prices, which are the prices at which shares are bought and sold respectively. The effect of the single pricing of OEICs is that buyers of OEICs pay less than the true cost of the shares, and sellers of OEICs

receive more than the actual receipts from the sale of shares held by the fund. This benefits investors who buy and sell frequently (holding the OEICs for short periods) at the expense of long-term investors.

The subsidy for short-term investors becomes greater when other transaction costs are considered. Buying and selling the shares held by the fund entails brokerage fees. These fees increase the effective cost of buying, and reduce the receipts from selling. If OEIC investors face a single price for buying and selling, they do not pay the brokerage costs. Those who buy and sell frequently receive free brokerage at the expense of the value of the fund, and hence at the expense of long-term investors. The effect is increased where taxes are payable on share transactions (such as the 0.5% stamp duty payable on share purchases in the UK).

The negative effect of single pricing on the value of the fund (arising from bid-offer spreads, brokerage costs, and taxation) is known as dilution. To overcome the cross-subsidy, between long-term and short-term investors, management companies may impose dilution levies or dilution adjustments. A dilution levy is a charge imposed on a buyer or seller of an OEIC for the purpose of covering the difference between the price of the OEIC and the actual net value of the transactions in the shares traded by the fund. A dilution adjustment is similar to a dilution levy, with the difference that the price of the OEIC is adjusted. If purchases of OEICs by investors exceed sales (redemptions), the price may be adjusted upwards to reflect the true net cost of buying shares for the fund. If sales of OEICs by investors exceed purchases, the price may be adjusted downwards in order to reflect the real net receipts from the sale of shares by the fund. This is sometimes known as swinging single pricing. A typical dilution adjustment may be +/- 0.30%. However in the cases of OEICs that deal in investments with high bid-offer spreads the adjustment may be much higher. For example a smaller companies fund could experience a dilution adjustment of +/- 1%. One result is that OEIC prices can fluctuate even when stock prices are stable.

Chapman (2006a) points out that dilution levies and dilution adjustments are little used by OEIC managers in the UK. It is frequently the case that several months, and in some cases more than a year, pass between occasions on which a levy or adjustment is imposed. The application of levies or adjustments is typically

reserved for days on which net sales or purchases are particularly large, or when an exceptionally large single transaction is made. However dealing costs are incurred continuously; and those costs are borne by long-term investors. Chapman cites the Financial Services Authority as suggesting that the average annual dilution cost is 0.19% of fund value but he expresses the view that dilution could be much greater and estimates that in some cases annual dilution costs could exceed 0.6%. Over long periods of time these dilution costs would have a substantial impact on the values of the investments of long-term investors. Forcing long-term investors to pay the trading costs of short-term investors can be very detrimental to the former. It would also be disadvantageous to the marketing efforts of the fund manager to the extent that marketing makes use of experienced long-term returns.

One way of dealing with the issue is to use dual pricing, so that there is a higher price for buying the OEIC than for selling. The difference could incorporate the transaction costs. In that way investors who frequently move into, and out of, OEICs pay the transaction costs instead of those costs falling on investors who remain invested for long periods. Another possibility is to use a futures fund (stock index futures combined with bank deposits; see the chapter on stock index futures) as part of the total fund. As short-term investors buy and sell OEICs, the resulting cash flows are matched by purchases and sales of futures contracts. The transaction costs of dealing in futures are much lower than the costs of dealing in shares.

Fair value pricing may be applied to both OEICs and unit trusts. It becomes necessary when market prices are stale (out-of-date). Published share prices are the prices at which the shares were last traded. In the cases of the shares of small companies there may be long periods between share deals. It may be several hours, days, or even weeks since the shares in a particular company were last traded. In consequence the published share price may be very different from the price at which the shares would trade in the present. When valuing OEICs (or unit trusts) it may be inappropriate to use published share prices when those prices are stale. Investors in OEICs and unit trusts would be paying and receiving prices that are poorly related to the true values of the shares held by the funds. When the companies whose shares are held by the fund experience infrequent trading in their shares, investment management companies may adjust the prices of the shares held in an attempt to more accurately reflect the prices at which the shares would trade

currently. The share prices used as a basis for valuing OEICs and unit trusts are the prices that the fund managers believe would prevail in the light of current market conditions.

Mutual Funds and the Provision of Liquidity

Mutual funds provide investors with liquidity since it is easy to acquire, and dispose of, portfolios of shares by means of buying and selling mutual funds. If investors were to create or liquidate portfolios directly, they would be involved in high costs in terms of time, effort, and money. By using mutual funds they avoid the expenditure of time and effort. In the case of index tracking funds, where initial charges are usually zero, they also avoid the financial costs. In the case of investment trusts, the financial costs are greatly reduced since only one purchase or sale transaction is involved.

However there are costs to the mutual funds of providing such liquidity. These costs arise from fund managers being forced to trade in shares when their retail investors choose to buy or sell, rather than when the fund managers would choose to trade. Since investment trusts (closed-ended funds) are not affected by retail trades in this way they do not bear these costs.

Retail investors tend to buy into mutual funds (e.g. buying units in a unit trust) when markets are rising and sell when markets are falling. The immediate effect of retail investment is an addition to the cash held in the fund, and the immediate effect of retail sales is a reduction of the cash held. A result of this is that mutual fund managers have a relatively large proportion of their funds in cash during rising markets (just when the funds should have a relatively large proportion in shares) and a low proportion in cash during falling markets (when a high proportion in cash would be preferable). Even during stable markets the transactions of retail investors will force fund managers into trades that they would otherwise not choose to make.

In these ways the provision of liquidity, by mutual funds, to retail investors can adversely impact on the performance of the funds. This would suggest a case for initial, and/or exit (withdrawal), charges that are payable into the fund. In this way frequent transactors in unit trust units, or OEIC shares, would

compensate long-term investors for their negative impact on fund performance. This could be seen as payment, by frequent transactors, for the liquidity provided by the funds.

Exercise 9.15

An OEIC keeps 5% of its fund in bank deposits in order to meet potential redemptions. If the real rate of return on the stock market as a whole is 7% p.a. whilst the real interest rate on bank deposits is 2% p.a., what is the effect of this liquidity provision on the rate of return of the fund?

Answer

The expected real rate of return on the fund is reduced from 7% p.a. to:

$$(0.95 \times 7\%) + (0.05 \times 2\%) = 6.75\% \text{ p.a.}$$

The provision of liquidity has reduced average real return from 7% p.a. to 6.75% p.a.

Exercise 9.16

An OEIC keeps an average of 5% of its fund in bank deposits in order to meet redemptions of shares (i.e. to provide liquidity for investors). When the market rises, increased demand for its shares leads to a net cash inflow and the bank deposits held increase to 10% of the fund. When the stock market falls, net sales of shares reduce the holding of bank deposits to 0% of the fund. During periods of market rise the real return on the (non-cash) portfolio is 17% p.a. During periods of market weakness the real return is -3% p.a. Bank deposits yield a real return of 2% p.a. Periods of market strength, and periods of weakness, occupy equal lengths of time. What is the effect of holding part of the fund in bank deposits on the average real return of the fund?

Answer

In the absence of bank deposits (no provision for the redemption of shares) the average real return is:

$$(0.5 \times 17\%) + (0.5 \times -3\%) = 7\% \text{ p.a.}$$

In the presence of bank deposits the real return during market strength is:

$$(0.9 \times 17\%) + (0.1 \times 2\%) = 15.3\% + 0.2\% = 15.5\% \text{ p.a.}$$

During market weakness the real return is -3% p.a. (there are no bank deposits).

So in the presence of bank deposits (during periods of market strength) the average real return is:

$$(0.5 \times 15.5\%) + (0.5 \times -3\%) = 6.25\% \text{ p.a.}$$

The provision of liquidity in a volatile market reduces the average real return from 7% p.a. to 6.25% p.a.

It might be noted that index tracker funds maintain 100% exposure to the stock market rather than holding part of the fund in deposits. Index tracker funds thereby avoid the reduction in returns arising from the holding of bank deposits (or other money market investments).

Another way in which purchases and sales of open-ended mutual funds, such as unit trusts and OEICs, can adversely affect the performance of those funds is by forcing fire sales and purchases in asset markets (Coval and Stafford 2007). Mutual funds that experience substantial outflows of money must sell assets. If a number of mutual funds are affected simultaneously the sale price of the assets, such as shares and bonds, could be temporarily depressed. The effect is that sales occur at relatively low prices. Widespread outflow-driven selling by mutual funds at fire sale prices entails sales at prices below fundamental value. Conversely sudden large inflows of funds can result in fire purchases which temporarily push up asset prices with the result that purchases are made at relatively high prices. Cash-flow driven transactions by mutual funds could be expected to have a negative effect on fund performance.

Even in the absence of fire sales the provision of liquidity, by institutional investors, to its customers can cause prices to move to the disadvantage of the institutions. The beneficiaries may be individual traders in stocks. Kaniel, Saar and Titman (2008) examined the relationship between net individual investor trading and short-term returns on stocks. They found that individuals tended to buy following price declines, and sell after price increases. It was also found that these trades by individuals proved to be profitable. Bought stocks showed subsequent price rises, and sold stocks experienced price falls. The authors suggested that their results were consistent with the view that individuals provide liquidity for institutions. When institutions buy, they bid up prices to relatively high levels and individuals take advantage by selling. When

institutions sell they force down stock prices and individuals take advantage of the low prices by buying. The provision of liquidity by individuals provides them with profits at the expense of the institutions.

Evidence on the Performance of Mutual Funds

There have been numerous studies of the performance of mutual funds. Performance is measured in terms of total return; that is dividend yield plus capital gains. Generally these studies have found that (i) on average funds under-perform stock indices, (ii) past relative performance is not a good guide to future relative performance, and (iii) funds with low charges and low portfolio turnover tend to outperform those with high charges and high turnovers.

A number of studies have found that mutual funds produce higher returns than indices before charges and costs are considered, but under-perform indices after allowance is made for such expenses (for example Shukla 2004; Wermers 2000; Daniel, Grinblatt, Titman and Wermers 1997). Although on average mutual funds appear not to outperform stock indices, some funds will provide better returns than indices. The question arises as to whether some funds persistently provide superior returns. If superior returns result from investment management skill rather than chance, persistence of relative performance would be expected. Although a few studies have suggested some persistence in relative performance in the short-term (up to three years) there is probably a consensus that there is no long-term persistence in performance (for example Hendricks, Patel and Zeckhauser 1993; Kahn and Rudd 1995; Jain and Wu 2000; Bollen and Busse 2004). It appears that past performance is not a useful guide for choosing between mutual funds.

Although the evidence of research studies indicates an absence of long-term persistence in the relative performance of funds, many investors believe that particular fund managers are persistently good or bad (and switch funds to follow favoured fund managers when those preferred managers move on to other funds). There is little research evidence on the effectiveness of this strategy, but Gallo and Lockwood (1999) found that when poorly performing funds change manager the result is on average an improvement in performance.

The majority of studies suggest that funds with high expenses tend to provide investors with lower returns (for example Reichenstein 1999; Indro, Jiang, Hu and Lee 1999; Bogle 1998; Carhart 1997; Carhart, Carpenter, Lynch and Musto 2002; Haslem, Baker and Smith 2008). However some studies point the other way (for example Shukla 2004). There is also evidence that high portfolio turnover (and hence high brokerage costs) is associated with lower net returns (such a relationship was found by Carhart 1997 and by Haslem, Baker and Smith 2008, but not by Carhart, Carpenter, Lynch and Musto 2002). Bogle (2002) compared the performance of high-cost US mutual funds (top quartile for annual costs, 1.8%) against the performance of low-cost mutual funds (bottom quartile, 0.6% p.a.) over 1991-2001 and found that the low cost funds outperformed the high-cost funds by more than the cost differential (by 2.2% p.a.). The low-cost funds also exhibited lower risk than the high cost funds. The strongly performing low-cost funds included index-tracker funds. The relative advantage of index-tracker funds was further enhanced by the consideration that they tended not to have front-end fees (loads) and by the fact that many of the worst performing actively-managed funds had been withdrawn or merged into other funds with the effect that the weakest funds were removed from the data when the average performance was calculated.

One study in the US (Fortin and Michelson 2005) found that, whereas most evidence about domestic (home country) actively-managed funds indicates that they fail to out-perform stock indices, the results are different in the case of funds invested internationally. With the exception of funds focused on Europe, actively-managed funds investing abroad out-performed their corresponding stock indices. There were no relationships between fund returns and expenses, there were positive relationships between fund return and fund turnover, and positive relationships between fund return and fund size. Again Europe funds were exceptions in that no relationships were found in the cases of these funds.

The question arises as to why investors predominantly buy actively managed funds if the evidence tends to suggest that index-tracking funds are likely to perform better. One explanation comes from behavioural finance. Investors incorrectly perceive their ability to select funds that will perform well. Goetzmann and Peles (1997) measured the recollections of investors in relation to the recent performance of their mutual funds. They investigated two groups of private investors and found that both groups over-estimated the

absolute performance, and performance relative the market. These over-estimates were substantial; both groups over-estimated performance relative to the market by around 5% p.a. It was suggested that memory adjusts in such a way as to improve the recalled performance. Cognitive dissonance has been suggested as an explanation (Baker and Nofsinger 2002). If people like to see themselves as wise investors, their memories of investment performance adjust to confirm their self-image. If reality conflicts with self-image, the memory of reality changes in order to be consistent with the self-image. Those distorted memories lead to investors being overconfident about their ability to choose funds that perform relatively strongly.

Another explanation arises from the influence of financial journalism on investors. Winnett and Lewis (2000) pointed out that financial journalists often promote the idea that it is possible to identify prospective future out-performers. A theme that runs through much financial journalism is that it is possible to spot winners and to beat the market. There is often a focus on identifying 'stars' and 'dogs' from league tables of funds. Financial journalism often implies that relative returns can be forecast from selective samples of past performance. However Winnett and Lewis acknowledged that some deviation from typical financial journalism has emerged from presentations and discussions of index tracker funds. As a result some financial journalists are now willing to discuss the idea that the market cannot be beaten.

An alternative explanation may lie in the fact that many mutual fund investors know little about the relative performance of actively managed funds. If a financial adviser recommends an actively managed fund, the investor is likely to follow that advice. If financial advisers were paid by means of commission, relative commission levels could affect their memories of relative performance. If actively managed funds pay more commission to the adviser than index-tracker funds, the adviser's perception and memory of relative performance may be influenced. If one's livelihood is at stake, one's perception and recollection of the evidence is likely to be affected by self-interest. It will be seen from the chapters that deal with behavioural finance (social and psychological biases in investment decision-making) that no-one is immune from bias. The human mind is not a disinterested computer, and memory is not a mechanical recording of the past.

Financial advisers may have a conflict of interests. The investments most suitable for their clients may not be those that pay the highest commission to the advisers. Fund managers may also face conflicts of interest. Maximising returns for investors in their funds, whilst avoiding unacceptable risk, might be seen as the only objective. However the fund managers also have a loyalty to the investment management companies that employ them. Gaspar, Massa and Matos (2006) investigated the possibility that loyalty to the employing company could dominate loyalty to the fund investors. In particular they investigated the possibility of cross-subsidisation between funds managed by the same company.

There is some evidence of a 'smart money effect' in that returns on new cash flows to mutual funds are higher than the average return for all mutual fund investors. This appears to be evidence supporting the view that investors can identify superior fund managers. However Sapp and Tiwari (2005) concluded that the relative out-performance of new money arose from a momentum effect. There is evidence that over a 3- to 12-month period there is some persistence in the performance of shares in that good performances continue for a few months, as do bad performances (see the chapter on weak form market efficiency). Sapp and Tiwara concluded that mutual fund investors invest in funds with recent good performance, and that the momentum effect causes the relatively good performance to persist for a few months following the investment of new cash. So the superior returns to new investments were seen to be a result of momentum rather than the result of identifying good fund managers.

Weigand, Belden and Zwirlein (2004) presented evidence that mutual fund managers tended to be momentum traders. It appeared that mutual fund managers often chose stocks on the grounds that those stocks had recently performed well. Weigand, Belden and Zwirlein found that this had adverse effects on mutual fund performance since the momentum effect (continuation of past price rises) soon ceased or reversed. They recommended that individual investors should not be guided, in their choices of stocks, by the choices of mutual fund managers.

Walter and Weber (2006) also found that mutual fund managers had a tendency towards momentum trading. They also concluded that mutual fund managers were prone to herding, which entails making the

same trading decisions as other managers. To the extent that mutual fund managers share a tendency towards momentum trading they would all buy following price rises, and sell following price falls, with the effect that they make the same trading decisions. There may be other factors that lead to herding, such as the desire to avoid substantial underperformance relative to other fund managers. One source of risk for the retail investor is the possibility that their fund manager under-performs relative to the average fund manager; this is known as active risk or management risk. Copying other fund managers reduces such active risk.

Walter and Weber found evidence consistent with the view that herding is most pronounced among successful fund managers. This may be because successful managers want to preserve earlier relatively strong performance in order to guarantee their bonuses, whereas unsuccessful ones gamble by deviating from the consensus in the hope of achieving relative out-performance. It is also consistent with prospect theory, which predicts that gainers act conservatively (and preserve their gains) whereas losers take risks, which could reverse the losses. Another factor explaining herding among mutual fund managers may be window dressing. Managers may fill their portfolios with recently successful stocks at times when they are due to report their portfolios in order to give the impression that they had selected successful stocks.

Dasgupta, Prat and Verardo (2006) investigated the purchases and sales of US institutional investors during the period 1983 to 2004. They distinguished stocks according to the persistence of buying and selling. If there had been net buying for each of the most recent five quarters a value of 5 was assigned, net buying in each of the most recent four quarters gave a persistence value of 4, net selling in each of the previous three quarters produced a value of -3 , and so forth.

It was found that there was an inverse relationship between subsequent performance and the persistence measure such that the most persistently sold stocks were subsequently the best performers, and the most persistently bought stocks turned out to be the worst performers. The degree of over- or under-performance was related to the extent of persistence. The researchers also found herding to be present amongst the institutional fund managers. These findings are consistent with the view that herd buying by institutions

causes overpricing, and subsequent poor returns. Herding with respect to sales pushes prices down to unjustifiably low levels, and the under-pricing provides subsequent high returns as fundamental values are restored.

It is often the case that an investment management company will have a range (or family) of different unit trusts or OEICs. For example a family of funds might include UK equity general, UK equity growth, UK equity income, UK smaller companies and UK special opportunities funds together with a range of other funds covering overseas investments and other asset classes. Gaspar, Massa and Matos suggested that the investment management company might regard some funds as high-value. High-value funds would include those charging high fees. Also since retail investors are disproportionately attracted to funds exhibiting recent high performance, particularly when those funds are new, such funds are likely to be regarded as high-value funds by the company. Gaspar, Massa and Matos found evidence that investment management companies reallocate performance among funds within a family so as to favour high-value funds. One mechanism appears to entail the trading of shares between funds at prices favourable to the high-value funds.

Dowen and Mann (2004) found that the existence of a large family of funds was advantageous to the average performance of funds within the family. There appeared to be cost savings when the same investment management company managed a large number of funds. They also found economies of scale such that large totals of assets under management were associated with lower average percentage management costs. Haslem, Baker and Smith (2008) found that large funds tended to out-perform small funds. The implication is that, on average, individual investors are better off in large funds, which are members of large fund families.

Carhart, Carpenter, Lynch and Musto (2002), and Chen, Hong, Huang and Kubik (2004), found no relationship between fund size and fund performance for most types of fund although the latter team of researchers found a negative relationship between fund size and performance in the case of funds specialising in smaller companies. They suggested that this negative relationship arose from the relatively

low liquidity of small company stocks. A large fund investing in illiquid stocks may move prices to its disadvantage when trading because the market cannot easily absorb large trades.

There can be economies of scale because many research, administration and marketing costs do not rise in proportion to fund size and large funds can negotiate low commission costs. Chen, Hong, Huang and Kubik found that there was a positive relationship between the performance of a fund and the size of the fund family of which it is a member. However they argued that, based on the ideas of Stein (2002), there may be reasons for diseconomies of scale within a fund dependent upon organisational structure. They argued that soft information, such as qualitative information from discussions with company managements, struggles to be heard in hierarchical organisations. Hierarchy requires those with information to convince their seniors of its importance. Hard information, such as accounting data, may be more readily communicated to others. In consequence large funds, if organised on a hierarchical basis, may undervalue soft information. The researchers provided evidence consistent with this view by showing that single-manager funds tended to out-perform funds managed by teams.

Star Performers and the Role of Chance

Financial journalists often make play of the idea of star funds that have performed exceptionally well over a past period. However the laws of probability suggest that a few funds will show consistently good performance, but purely as a matter of chance. If there is a 50% chance of beating the average in any year, it is to be expected that a fund has a $(0.5)^{10} = 0.1\%$ chance of outperforming the average every year for ten years. So out of 1,000 funds one can be expected to outperform every year for ten years, purely as a matter of chance. The corresponding figure over five years is 31 funds $[(0.5)^5 \times 1000]$. Since there are thousands of funds available to investors, it is not surprising that a few will appear to be star funds with consistently high returns.

When ranking funds on a risk-adjusted basis some will appear to be outstanding performers. The question arises as to whether such funds should be seen as having superior investment management. If they do exhibit high-quality fund management, they would be candidates for purchase. However some funds would

show exceptional performance simply as a matter of chance. Marcus (1990) looked at the performance of the Magellan fund in the US. That fund had outperformed the S&P 500 index in 11 out of the 13 years up to 1989, and appeared to be a star performer. Using computer simulations Marcus found that, in a sample of 500 funds, the expectation was that there is a 99.8% chance that the best performing fund would beat a stock index in 11 years or more.

Evidence consistent with the existence of star performers comes from Kosowski, Timmermann, Wermers and White (2006). They employed a distribution of returns that provided a better representation of experienced returns than the normal distribution. They concluded that there were more top-performing fund managers than would be expected on the basis of chance. They found that in a sample of 1,788 US domestic equity mutual funds, 29 met their criterion of superior performance as opposed to the 9 that would have been expected on the basis of pure chance. However they found that the superior returns apparently resulting from skill mostly occurred before 1990, and were limited to growth funds (as opposed to income funds). They also found that these apparently superior skills showed persistence over time, a result also found by Harlow and Brown (2006). Harlow and Brown found that, by identifying causes of persistence in relative performance, it was possible to successfully identify future high performers with nearly 60% accuracy.

Cuthbertson, Nitzsche and O'Sullivan (2008) investigated UK mutual funds (unit trusts) using a methodology that allowed for distributions of returns that differed from the normal distribution. They found strong performance, which was not due to luck, in a very small proportion of cases. Those cases were amongst equity-income funds rather than all-company or smaller-company funds. In most cases strong performance was due to chance. However a much larger proportion of poor performers were not merely unlucky. The results of the research strongly rejected the view that most poor performers were simply unlucky. The researchers found that relative performance persisted amongst the weak funds but not amongst the strong performers. They concluded that it is extremely difficult for investors to identify actively managed funds, which genuinely demonstrate skill, and that buying index-tracker funds is the best strategy for investors.

Cuthbertson, Nitzsche and O'Sullivan (2008a) arrived at similar conclusions using a different methodology. This time they estimated false discovery rates amongst UK equity mutual funds. False discovery rates measure the proportion of out-performers that perform strongly because of chance (similarly for poor performers). They found that only about 2% of funds out-performed their benchmarks because of skill. However they found that about 20% of funds under-performed as a result of poor investment skill. The finding that very few funds showed skilled management was found for all-company, smaller-company and equity-income funds. They found that there were substantial proportions of funds in the all-company and smaller-company sectors that under-performed due to poor management skill, but not amongst equity-income funds. They also found that around 80% of funds showed neither positive nor negative fund management skill.

Mamaysky, Spiegel and Zhang (2007) suggested that it was not appropriate to use the same statistical model to test the performance of all mutual funds since funds have styles and strategies of portfolio construction that vary considerably. Using the same model to evaluate the performance of all funds had been normal practice amongst researchers. This raises the possibility that the failure of many researchers to find predictability of the relative performance of mutual funds had arisen from the use of the inappropriate research methodology of using the same statistical model for all funds.

Fund managers have a vested interest in promoting the funds that have shown such high returns, since the information will attract many new clients. Journalists will also report on such funds since they provide a degree of sensationalism. A cynic might be tempted to suggest that newspapers may be more inclined to report on such funds if the fund managers pay for advertisements in those newspapers.

Arguably publicised strong performance is a very effective form of advertising. Atkinson and Sturm (2003) examined the selection of 'all-stars' by a major US mutual fund advisory service. Describing a mutual fund as an 'all-star' appeared to have a positive effect on the flow of money into the fund; so it proved to be

effective advertising. The authors reported no convincing evidence of post-selection performance that was superior to the market.

Head Count Averages versus Value Weighted Averages

Most studies of the relative performance of actively-managed funds have used 'head-count' averaging rather than weighting performance by fund size. Consider the following example.

There are six funds in the market and their sizes, and returns relative to a stock index, are:

<u>Fund</u>	<u>Size</u>	<u>Out-performance</u>
A	£500m	+4% p.a.
B	£100m	-2% p.a.
C	£100m	-2% p.a.
D	£100m	-2% p.a.
E	£100m	-2% p.a.
F	£100m	-2% p.a.

The head-count average (mean) would be:

$$\frac{4 - 2 - 2 - 2 - 2 - 2}{6} = \frac{-6}{6} = -1\% \text{ p.a.}$$

The value weighted average would be:

$$(0.5)4 - (0.1)2 - (0.1)2 - (0.1)2 - (0.1)2 - (0.1)2 = +1\% \text{ p.a.}$$

By using a head-count average, funds (on average) appear to have under-performed the stock index. When using a value weighted average, funds appear to have out-performed. If the aim is to ascertain whether the typical fund manager demonstrates investment skill, the answer is no. If the aim is to find out if the typical investor has obtained out-performance, the answer is yes.

Most studies of fund performance have used head-count averages. This is appropriate if the objective of the research is to learn if fund managers, on average, display investment skill. From the perspective of the average investor, the relevant average is the value weighted average. If the value-weighted average (mean) shows out-performance then the average retail (individual) investor would have experienced out-performance.

Carosa (2005) used a value-weighted average and concluded that US equity funds showed out-performance, relative to the S&P 500 index, between 1975 and 2004. An interesting additional finding was that there appeared to be long periods during which actively-managed funds out-performed the index, and other long periods characterised by underperformance by actively-managed funds. Riepe (2009) made the point that actively-managed equity funds tend to overweight holdings of smaller company stocks relative to stock indices. So it would be expected that actively-managed funds perform well, relative to stock indices, when small-company stocks perform well relative to large-capitalization stocks. Riepe also suggested that actively-managed bond funds tend to underweight government bonds implying that actively-managed bond funds do well, relative to bond indices, when corporate bonds outperform government bonds.

Why Most Funds Are Below Average

The consensus of research evidence suggests that the average mutual fund underperforms its relevant stock index by approximately the value of the fund charges. In the case of actively-managed mutual funds this average below-the-market performance is obtained at the cost of additional risk. This additional risk is the management (or active) risk. It is the risk that the chosen fund performs less well than the average fund.

One question that arises concerns the meaning of the term 'average'. Probably the most common interpretation is to treat the term as equivalent to the mean. Consider the following series of numbers: 10;4;3;2;1. The mean is $(10+4+3+2+1)/5 = 4$. An alternative measure of average is the median, which is the value of the middle number. The median of the series of numbers is 3, since there are two numbers above and two below.

A casual glance at mutual fund performance tables (for example as appear in ‘Money Management’ magazine) indicates that the median is typically lower than the mean. This implies that the majority of funds show performance below the mean. Most funds are below average (when the mean is seen as the average). The relationship between the mean and the median reflects a skew in the distribution of fund performances (Trainor and Baryla, 2008). The skew entails some bunching towards the bottom.

Suppose that each year active management results in either a 10% out-performance or a 10% under-performance, and that the two possibilities occur with equal likelihood. If the initial position is that the value of the fund is 100, the possible values over the following 4 years are shown by the matrix in figure 9.1.

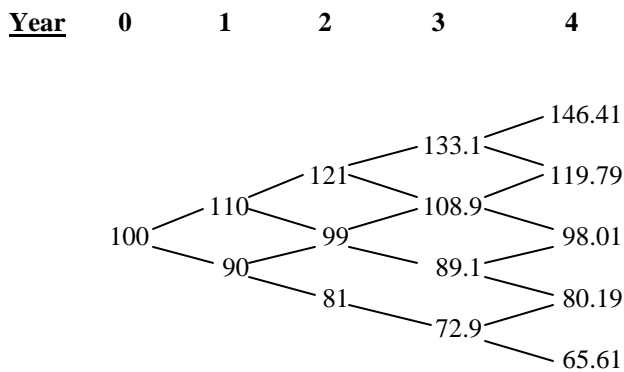


Figure 9.1

In the case of year 2 the mean of the values is 100 (bear in mind that there are two possibilities for 99, and hence it should be included twice). The median is 99. The median is below the mean.

In the case of year 4 the mean is 101 (bear in mind that the top and bottom values have just one chance whereas the other values have two, and so should be weighted appropriately when calculating the mean). The median is 98.01. The median is below the mean.

In years 1 and 3 half the outcomes are above the mean and half are below the mean. In years 2 and 4 most of the outcomes are below the mean. There is a tendency for most outcomes to fall below the average, when the average is interpreted as the mean.

It is probably reasonable to assume that the mean performance of mutual funds is in line with overall stock market performance (as measured by stock indices) minus the effects of fund charges and expenses. It is also reasonable to assume that the performance of index tracker funds is close to the performance of their corresponding stock indices, net of charges and expenses. It could be supposed that the mean performance of index trackers is superior to the mean performance of actively-managed mutual funds because index-tracking funds have lower charges and expenses. If index trackers have mean performances that better the mean performances of actively-managed funds, and since most actively-managed funds under-perform the mean of actively-managed funds, it could be expected that index-tracking funds tend to be in the top half of performance tables. Casual observation of performance tables confirms this. It appears that on average index-tracking funds out-perform actively-managed funds whilst avoiding the management (active) risk that characterises actively-managed funds.

Implications of the Evidence for Investment Decisions

A huge amount of research has been carried out on the performance of fund managers. Some of the research evidence has been cited in this chapter and more is cited in chapters 17 and 26. The evidence is ambiguous; some dismisses the ability of fund managers to outperform stock indices, whereas some research suggests that there are managers capable of outperforming. Also there is controversy about whether any out-performance shows persistence and can be predicted by retail (i.e. individual) investors or their advisers.

The two extreme conclusions are:

1. Investment managers are never capable of persistently and predictably out-performing stock indices.

2. The research evidence does not justify any doubt about the ability of investment managers to out-perform stock indices.

Having surveyed the evidence many investors would take a position between the two extremes. However those positions are likely to be tilted towards one or other of the extremes.

What are the implications for investment decisions? The position which asserts that active fund management has no value implies that the whole of an investor's portfolio should be invested in index-tracker funds. This strategy has been suggested by a number of prominent investment experts, mainly academics. The position that asserts that there is no doubt about the value of active management implies that the whole of an investor's portfolio should be invested in funds selected on the basis of expected out-performance. This strategy is often promoted in newspapers and magazines (by people, it might be suspected, who are unaware of the research carried out by academics on fund performance).

What are the implications for an investor who takes a middle view? Baks, Metrick and Wachter (2001) suggest an investment decision-making process with two interacting dimensions. One dimension involves taking a position about the possibility of manager out-performance, perhaps with some weighting in the case of a middle way (e.g. 80% inclined to believe that active fund management is ineffective, and 20% inclination to accept that it can work). The attitude towards active fund management (an extreme or a middle way) is referred to as a prior belief. The prior belief interacts with an assessment of the prospective performance of individual funds.

At one extreme no fund is identified as a prospective out-performer. In that case investment might be entirely in index-tracker funds irrespective of prior beliefs. If some funds are identified as prospective out-performers, the investment portfolio would be determined by the interaction of prior beliefs and the strength of conviction about the potential out-performance. A prior belief that leans away from active management, together with weak evidence of prospective out-performance by individual funds, should result in a portfolio that is predominantly (but not necessarily exclusively) invested in index-tracker funds.

A prior belief that is favourably disposed to active management, together with clearly identified strong funds, should result in a portfolio that is predominantly (but not necessarily exclusively) invested in actively managed funds.

The fact that research evidence is mixed may make it difficult to take one of the extreme prior belief positions. Also it is highly unlikely that there is no evidence to favour some funds over others, and equally unlikely that evidence on prospective relative performance leaves no room for doubt. The implication is that combinations of index-tracker funds and actively-managed funds should be the norm.

Conclusion

Mutual funds comprise unit trusts, OEICs, and investment trusts. They are all collective investments in that they aggregate the investments of a large number of individuals. The sums thus accumulated are used to buy a portfolio of assets, which has more diversification than can normally be achieved by an individual.

Financial journalists often describe particular mutual funds as stars or dogs. Stars are the top performers, and dogs are at the bottom (this is easy reporting for the journalists since their investigations need go no further than published performance tables). This categorisation is always based on past performance and is typically taken to imply something about the quality of investment management (and hence prospective future performance). However investment performance will vary simply as a matter of chance. It is far from clear that the stars and the dogs reach their relative positions as a result of anything other than pure chance. In the chapters on evaluating the performance of fund managers and on the Efficient Markets Hypothesis it will be seen that the evidence indicates that past performance is a very poor guide to future performance.

In the chapters that deal with behavioural finance (the social and psychological biases that influence investors), it is contended that people are reluctant to accept that some outcomes are the result of chance. People tend to look for causes, and for patterns in events, and are prone to see causes and patterns that do

not exist. Investors should seek to overcome this psychological bias, along with the other biases that are common amongst investors.

If it is accepted that good performance is a matter of luck, rather than investment management skill, the individual investor may be advised to buy an index-tracker fund that simply aims to follow a stock market index. Index-tracker funds avoid the costs of active fund management (and hence have lower charges) and they avoid management risk, which is the risk that a particular fund will perform relatively badly. Over long periods of time, even small differences in fund charges can make a large difference to the final value of an investment. Taxation can also have a substantial impact on the long-term outcome of an investment.

The evidence on mutual fund performance tends to be unfavourable to active fund management, and hence favourable to index-tracker funds (the evidence is presented in this chapter and in the chapters on the Efficient Markets Hypothesis and on evaluating the performance of fund managers). However, as indicated in the chapters on stock indices and portfolio diversification, index-tracker funds may not provide the best possible diversification. Portfolio diversification reduces portfolio risk since the weak performance of some shares would tend to be offset by strong performance from others. However stock indices may not represent well-diversified portfolios. For example in the UK the largest ten companies represent nearly half the total value of the stock market, and those companies are concentrated in a small range of sectors.

Mutual funds often use financial derivatives (futures, options, and swaps). Although when used on their own derivatives can be very risky, when used in conjunction with a portfolio of investments they can reduce risk (as shown in the chapters on futures, options, and swaps). Not only can derivatives reduce risk, but also they can be used to enhance returns. The chapter on structured products shows how whole new classes of mutual funds can be constructed by using financial derivatives.