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# Closed-End Fund Betas

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Abstract
The CAPM can explain closed-end fund (CEF) discounts as a consequence of the higher betas on CEF shares than on their underlying portfolios. The difference in betas is much greater for international funds and for bond funds than for domestic equity funds. CEF shares carry both more idiosyncratic risk (usually) and more systematic risk than their portfolios, and also exhibit excess volatility. The difference in betas reflects the sensitivity of CEF price returns to market returns, after controlling for portfolio returns. The influence of home market returns on international fund prices is particularly marked in UK funds.

Keywords: closed-end funds, investor sentiment, risk

JEL Nos: G12

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## 1. INTRODUCTION

Research on closed-end fund prices has encompassed equity funds, country funds and bond funds, but seldom all of these together. This paper investigates risk in closed-end funds (CEFs), using a sample of UK and US domestic equity funds, UK and US international funds, and US bond funds. We inquire whether phenomena such as premium mean-reversion, excess volatility, greater systematic risk of CEF shares relative to their underlying portfolios, and under-reaction of prices to movements in net asset values (NAVs) are universal, or apply only to some types of fund. We highlight differences between equity and bond funds, between equity funds holding domestic and international assets, and between funds traded in the UK and the US.

Closed-end funds differ from other companies in that their assets are financial rather than physical and are mostly traded on securities markets. This implies that the current market value of their underlying assets is readily observable. Pontiff (1997) has used this feature to show that CEF prices exhibit excess volatility relative to their portfolios. It also enables us to establish whether a CEF trades at a premium (price > NAV) or a discount (price < NAV). Malkiel (1977) reviews traditional explanations of the widespread tendency for funds to trade at a discount, and finds them wanting. Thompson (1978) shows that funds on higher discounts yield higher returns before trading costs, because of mean-reversion of the discount.

Lee *et al.* (1991), building on the noise-trader model of De Long *et al*. (1990), suggest that CEF discounts exist because of the systematic element in discount risk. This systematic element means that the beta of a closed-end fund (i.e. the sensitivity of its price to returns to the market index) tends to be greater than that of an equivalent open-

end fund, or, to put it another way, the fund beta is greater than its NAV beta. Empirical evidence of this has been provided by Bodurtha *et al*. (1995) (US country funds), Elton *et al*. (1998) (US equity and bond funds) and Pontiff (1997) (US equity funds). The discount rewards holders of CEFs for the additional systematic risk, because the same stream of dividends is purchased at a lower price.

In this paper we examine equity funds traded in the UK and the US that specialise in domestic assets, and ones that specialise in international assets. We also examine bond funds traded in the US. We first investigate market betas on the funds and on their NAVs. Then we consider issues of excess volatility and a decomposition of risk into its systematic and idiosyncratic components. Finally we estimate return regressions to establish the extent of price under-reaction to NAVs and the influence of discounts and market index returns. The results exhibit a surprising degree of heterogeneity across different types of fund.

## 2. THEORY

Denote the net asset value of a collective fund at time $t$ by $N_t$, the price at which it trades by $P_t$, the dividend payment by $D_t$, and the premium of the price to net asset value by $M_t$. By definition

$$M_t = (P_t - N_t)/N_t \qquad (1)$$

A negative premium is described as a discount.

In the case of an open-end fund, $P = N$ at all dates and the discount is zero. The one-period return on an OEF is:

$$R_{OEF,\,t} = (N_t - N_{t-1} + D_t)/N_{t-1} \qquad (2)$$

Because an OEF holds a wide range of assets, it is likely to have a beta close to unity. The one-period return on a closed-end fund is:

$$R_{CEF,\,t} = (P_t - P_{t-1} + D_t)/P_{t-1} \tag{3}$$

Using (1), the CEF return may alternatively be expressed as:

$$R_{CEF,\,t} = [(1+M_t)/(1+M_{t-1})][(N_t - N_{t-1})/N_{t-1}] + (M_t - M_{t-1})/(1 + M_{t-1}) + D_t/P_{t-1} \tag{4}$$

which shows that the CEF return consists of a NAV element (the first term), a premium change element (the second term) and a dividend element (the last term). If premium movements are positively correlated with returns on the market index (and therefore with the first term in (4)), a CEF will tend to have a higher beta than an OEF holding the same assets.[1] The capital asset pricing model (CAPM) predicts that assets with higher betas earn higher returns in equilibrium. Subtracting (2) from (4) and rearranging gives the difference in returns between a CEF and an OEF holding the same assets:

$$R_{CEF,\,t} - R_{OEF,\,t} = [(M_t - M_{t-1})/(1 + M_{t-1})]\{1 + [(N_t - N_{t-1})/N_{t-1}]\} - (D_t/N_{t-1})[M_{t-1}/(1 + M_{t-1})] \tag{5}$$

Let the equilibrium value of the premium be $M^*$. At equilibrium $M$ is expected to stay at $M^*$. The first term on the right-hand side of (5) is then zero, and so in equilibrium the difference in expected returns on a CEF and an OEF with the same assets is:

$$R^*_{CEF} - R^*_{OEF} = -(D/N)[M^*/(1 + M^*)] \tag{6}$$

Equation (6) shows that in equilibrium CEFs earn higher returns than an equivalent OEF provided that CEFs trade at a discount ($M^* < 0$). According to the CAPM, discounts are the equilibrium state provided CEF prices have higher betas than their NAVs.

[1] Equivalently, the CEF price will have a higher beta than its NAV. This equivalence breaks down in cases where, as in the UK, CEFs can borrow to finance investment in risky assets, whereas OEFs cannot.

None of the above explains why premium movements in CEFs should be positively correlated with market returns. Since the supply of CEF shares is virtually fixed in the short run, any shift in demand is likely to affect the price. The most plausible explanation is that demand behaves as it does in OEFs, for which net inflows are strongly positively correlated with market returns (Sirri and Tufano, 1998; Karceski, 2002), and the effect emerges in prices rather than quantities.

## 3. DATA AND METHODOLOGY

We study samples of domestic and international equity closed-end funds traded in the United Kingdom and the United States and bond funds traded in the United States.[2] For the United States, end-of-month price and NAV are from Bloomberg Financial Markets and dividend yields are obtained from Datastream (where price and NAV data overlap in Bloomberg and Datastream the figures are identical). Dividend yields reported in Datastream are annualised, so we adjust the figures to represent monthly dividend yields. Appendix Table 1 contains a list of the U.S. funds and the sample ranges. For the United Kingdom, end-of-month data on price, NAV, and dividend yields are from Datastream. The U.K. funds and sample ranges are shown in Appendix Table 2.

We use domestic and international market indexes in some of our regressions. For domestic funds the stock market index is that of the domestic market (Datastream's US Global Return Index and UK Global Return Index); for international funds it is the world market index in the appropriate currency (Datastream's Global World Total Return Index). The bond market index is Lehman Brothers' US Aggregate Bond Total Return Index (also from Datastream).

Excess returns are computed by subtracting safe rates of return from fund returns. The safe rates of return are one-month eurodollar and eurosterling interest rates.

We stack the data on individual funds within the categories of domestic equity funds, domestic bond funds, and international equity funds, for each of the United States and the United Kingdom – a total of five categories, since bond funds do not exist in the UK. We estimate the parameters of the models by OLS. We estimate the standard errors of the OLS parameter estimates using a technique that is robust to both autocorrelation and heteroskedasticity.

This estimation approach has three advantages over the commonly used procedure of estimating a cross-section regression for each date, then averaging the resulting estimates of each parameter over all dates and calculating a standard error for this average, as in Fama and Macbeth (1973). It automatically corrects estimated standard errors for serial correlation; it corrects for arbitrary forms of heteroskedasticity; and it allows for the "non-rectangular" nature of the data set, with more observations at later dates (because of the expansion in the number of funds in the market). The Fama-Macbeth method, when applied to an unbalanced panel, weights parameter estimates from dates with few observations equally with parameter estimates from dates with many observations. Implicitly, therefore, each observation from dates with few observations is exerting greater leverage over the results. This is particularly unfortunate in cases where, as here, these observations are the furthest back in time, and therefore have least relevance to the future. We have, however, checked that Fama-Macbeth estimation would yield similar results.

[2] There are no closed-end bond funds in the UK market.

## 4. EMPIRICAL RESULTS

Table 1 demonstrates that closed-end fund prices do indeed have higher market betas than their NAVs. Betas are estimated separately for domestic and international equity funds traded in the US and the UK, and bond funds traded in the US, using monthly data. The beta is the regression coefficient of the fund's monthly excess return (relative to a safe return) on the monthly excess return on the stock (or bond) market index. For bond funds results are shown using both stock and bond index returns. For all groups of funds the share price beta is greater than the NAV beta. The difference is smallest for domestic equity funds, and largest for bond funds. It is significant at the 1% level for bond and international equity funds, but not significant at the 5% level for domestic equity funds. Note that these results imply that market-related noise trader risk amounts to only a few percent of share price (beta) risk for domestic equity funds, between 20 percent (UK funds) and 40 percent (US funds) for international funds, and 50 percent for bond funds.

The analysis of risk is taken further in Table 2. In the first two columns of Table 2, systematic risk is split into its two components (the standard deviation of returns and the correlation of fund returns with market returns). The product of these two components is equal to beta times the standard deviation of market returns. In columns (3) and (4) of Table 2, risk is separated into its systematic and idiosyncratic components. For each group of funds, this is done for both NAV returns and stock price returns. Salient features of Table 2 are the following.

(1) Fund returns are always more volatile than NAV returns, but the effect is particularly marked in bond funds, where the standard deviation is almost twice as high.

(2) Correlation of returns with market returns is highest for UK equity funds of either type, and lowest for bond funds (using either the bond or the equity index).

(3) The ratio of systematic to idiosyncratic risk is low for bond funds and particularly high for UK funds.

One would expect that, if there is a large difference between the market beta of the fund's price and its NAV, that movements in the premium would be highly correlated with market returns. Movements in the premium are closely related to the difference between the share price returns and NAV returns. Accordingly Table 3 shows a regression for monthly share price returns that controls for NAV returns, the initial premium, market index returns and lagged share price returns. The initial premium has the expected negative coefficient for every type of fund, and is highly significant, which confirms Thompson's (1978) original result. Lagged share price returns have a significant negative coefficient for US funds only. Index returns always have a significant positive coefficient. For international equity funds, both world and domestic index returns are included in the regression. For US funds, both are significant, but world returns are much more so. For UK funds, only the returns to domestic equities seem to matter. Thus the influence of home stock market returns identified by Bodurtha *et al*. (1995) for US country funds is actually much stronger in the UK than in the US.[3] Bond fund returns are correlated with both bond and equity index returns.

## 5. CONCLUSIONS

The prices of closed-end fund shares show greater sensitivity to market returns than do their net asset values. This is consistent with a CAPM explanation of discounts, and

suggests that demand for closed-end funds responds to the performance of equity markets in a way similar to demand for open-end funds. Nevertheless the effect is much more marked in bond funds and in international equity funds than in domestic equity funds, for which the difference in betas is not statistically significant, and it would be interesting to investigate if the same is true for net inflows into open-end funds.

In addition, the following conclusions can be drawn.

(1) In all types of fund, prices are more volatile than NAVs, dramatically so in the case of bond funds.

(2) Idiosyncratic risk is particularly high relative to systematic risk in bond funds, and rather low in UK funds.

(3) Monthly share price returns are strongly negatively correlated with the start-of-month premium for all types of fund.

(4) Bond funds do not demonstrate the under-reaction of prices to NAV movements that is characteristic of equity funds.

(5) Returns are higher relative to NAV returns when market index returns are higher, but the effect is weakest in domestic equity funds.

(6) Returns on UK international funds are sensitive to returns on the UK market index only. Returns on US international funds respond primarily to global index returns, with only a relatively small excess weight on US market returns.

(7) After controlling for other factors, there is significant negative autocorrelation in monthly returns on US funds, but not on UK funds.

[3] World index returns are not significant in the domestic equity funds regression for the UK or the US.

REFERENCES

De Long, J. Bradford, Andrei Shleifer, Lawrence H. Summers and Robert J. Waldmann (1990), Noise Trader Risk in Financial Markets, Journal of Political Economy 98 (4), 703-38.

Elton, Edwin J., Martin J. Gruber and Jeffrey A. Busse (1998), Do Investors Care About Sentiment? Journal of Businesss 71(4), 477-500.

Fama, E.F., and J.D. MacBeth (1973), Risk, Return, and Equilibrium: Empirical Tests, Journal of Political Economy 91, 607-36.

Karceski, Jason (2002), Returns-Chasing Behaviour, Mutual Funds, and Beta's Death, Journal of Financial and Quantitative Analysis 37 (4), 559-94.

Lee, Charles M.C., Andrei Shleifer and Richard H. Thaler (1991), Investor Sentiment and the Closed-end Fund Puzzle, Journal of Finance 46 (1), 75-109.

Malkiel, Burton G. (1977), The Valuation of Closed-End Company Shares, Journal of Finance 32, 847-59.

Newey, Whitney K., and Kenneth D. West (1994), Automatic Lag Selection in Covariance Matrix Estimation, Review of Economic Studies 61, 631-53.

Pontiff, Jeffrey (1995), Closed-end Fund Premia and Returns: Implications for Financial Market Equilibrium, Journal of Financial Economics 37, 341-70.

Pontiff, Jeffrey (1997), Excess Volatility and Closed-End Funds, American Economic Review 87, 155-69.

Sirri, E.R., and P. Tufano (1998), Costly Search and Mutual Fund Flows, Journal of Finance 53, 1589-1622.

Thompson, Rex (1978), The Information Content of Discounts and Premiums on Closed-End Fund Shares, Journal of Financial Economics 6 (2/3), 151-86.

Table 1. Market Betas on Closed-end Fund NAVs and Prices

| | Dependent Variable | | |
|---|---|---|---|
| Fund type | NAV Returns | Share Price Returns | Share Price Returns minus NAV Returns |
| | Coefficient (*t*-statistic) of Index Returns | | |
| US-traded domestic equity | 0.599<br>(15.5) | 0.648<br>(13.8) | 0.047<br>(1.46) |
| US-traded international equity | 0.886<br>(15.4) | 1.302<br>(21.3) | 0.416<br>(10.4) |
| UK-traded domestic equity | 0.884<br>(49.7) | 0.915<br>(34.8) | 0.032<br>(1.77) |
| UK-traded international equity | 1.026<br>(16.7) | 1.206<br>(16.8) | 0.181<br>(4.69) |
| US-traded bond<br>(equity price index) | 0.209<br>(13.1) | 0.397<br>(10.3) | 0.188<br>(6.00) |
| US-traded bond<br>(bond price index) | 0.490<br>(10.7) | 1.013<br>(11.1) | 0.523<br>(7.26) |

Notes. The figures in parentheses are robust standard errors. Betas are estimated from the regression $R = \alpha + \beta M + u$, where $R$ is the one-month excess return on the closed-end fund relative to the one-month eurodeposit rate, and $M$ is the one-month excess return on the stock or bond market index relative to the eurodeposit rate.

Table 2. Decomposition of Risk

| Fund type | Share price/NAV returns | Standard deviation of returns | Correlation with market returns | Systematic risk | Idiosyncratic risk |
|---|---|---|---|---|---|
| | | $\sigma$ | $\rho$ | $\rho\sigma$ | $(1-\rho)\sigma$ |
| US domestic equity | NAV | 4.68 | 0.537 | 2.51 | 2.17 |
| | SP | 5.34 | 0.507 | 2.71 | 2.64 |
| US internat'l equity | NAV | 8.68 | 0.427 | 3.71 | 4.98 |
| | SP | 10.35 | 0.526 | 5.45 | 4.90 |
| UK domestic equity | NAV | 5.17 | 0.818 | 4.23 | 0.94 |
| | SP | 6.32 | 0.693 | 4.38 | 1.94 |
| UK internat'l equity | NAV | 7.19 | 0.660 | 4.75 | 2.44 |
| | SP | 8.77 | 0.636 | 5.58 | 3.19 |
| US bond (bond index) | NAV | 2.55 | 0.209 | 0.53 | 2.01 |
| | SP | 5.04 | 0.218 | 1.10 | 3.93 |
| US bond (stock index) | NAV | 2.55 | 0.345 | 0.88 | 1.67 |
| | SP | 5.04 | 0.332 | 1.67 | 3.37 |

Notes. The table shows the standard deviation of log returns multiplied by 100. Results for US bond funds are shown using returns on both the bond and the stock index.

Table 3. A Model of Monthly Closed-End Fund Returns

| Sample: | US-traded domestic equity | US-traded international equity | UK-traded domestic equity | UK-traded international equity | US-traded bond |
|---|---|---|---|---|---|
| Independent variable | | | | | |
| Constant | –0.0041<br>(–2.45) | –0.0143<br>(–7.81) | –0.0104<br>(–7.03) | –0.0173<br>(–6.87) | –0.0032<br>(–2.87) |
| Domestic index return | 0.216<br>(4.94) | 0.113<br>(2.00) | 0.156<br>(3.23) | 0.301<br>(5.75) | 0.164<br>(4.50) |
| World index return | | 0.517<br>(7.40) | | 0.061<br>(1.03) | |
| Bond index return | | | | | 0.277<br>(3.10) |
| Fund NAV return | 0.703<br>(11.7) | 0.778<br>(24.5) | 0.848<br>(18.0) | 0.879<br>(18.6) | 1.002<br>(13.6) |
| Share price return (t-1) | –0.056<br>(–2.60) | –0.088<br>(–5.05) | 0.002<br>(0.10) | 0.014<br>(0.64) | –0.109<br>(–4.10) |
| Premium (t-1) | –0.066<br>(–4.43) | –0.082<br>(–9.05) | –0.066<br>(–9.85) | –0.113<br>(–8.06) | –0.094<br>(–7.82) |
| R-squared | 0.532 | 0.631 | 0.655 | 0.731 | 0.338 |
| Standard error | 0.0366 | 0.0630 | 0.0371 | 0.0454 | 0.0410 |
| Sample size | 3935 | 6773 | 5782 | 5233 | 4239 |

Notes. The figures in parentheses are robust *t*-statistics. The dependent variable is $[\ln(P(t) + D(t)) - \ln(P(t-1))]$. All returns are monthly and are in $ for US-traded funds and in £ for UK-traded funds. Details of the market indices are given in the text. NAV return = $[\ln(N(t) + D(t)) - \ln(N(t-1))]$, and Premium = $\ln[(P(t)/(N(t)]$. $N(t)$ and $P(t)$ are respectively the net asset value and the price of the fund at the end of month $t$, and $D(t)$ is the dividend and capital gain distributions paid during month $t$. Ln = natural logarithm.

Appendix Table 1a: US Domestic Closed-End Funds

| | Sample Range | | Sample Range |
|---|---|---|---|
| General American Investors | 1988.2-2001.7 | Lincoln National | 1988.1-2001.6 |
| Salomon Brothers Fund | 1990.5-2001.6 | Adams Express | 1988.2-2001.6 |
| Central Securities | 1988.2-2001.7 | Tri-Continental Corp | 1988.2-2001.7 |
| Engex | 1988.2-2001.6 | Bergstrom Capital | 1994.6-2001.7 |
| Gabelli Equity Trust | 1988.2-2001.7 | Source Capital | 1988.2-2001.7 |
| Zweig Fund | 1988.2-2001.7 | Bancroft Convertible | 1988.2-2001.7 |
| Royce Value Trust | 1988.2-2001.7 | Castle Convertible | 1988.2-2001.7 |
| Smallcap Fund | 1989.11-2001.7 | Ellsworth Conv. | 1988.2-2001.7 |
| Royce Micro-Cap Trust | 1994.7-2001.7 | Liberty All-Star | 1988.2-2001.7 |
| Morgan FunShares | 1994.7-2001.6 | TCW Conv. | 1988.2-2001.6 |
| Alliance All-Market Advantage Fund | 1994.11-2001.7 | Blue Chip Value | 1988.2-2001.7 |
| Gabelli Convertible | 1995.3-2001.7 | Zweig Total Return | 1988.10-2001.7 |
| Franklin Multi-Income | 1991.11-2001.7 | MFS Special Value | 1990.7-2001.7 |
| Franklin Universal | 1988.12-2001.7 | Putnam Conv. | 1988.1-2001.7 |

Appendix Table 1b: US International Closed-End Funds

| | Sample Range | | Sample Range |
|---|---|---|---|
| Taiwan Fund | 1988.1-2001.12 | Mexico Equity and Income | 1991.8-2001.12 |
| Third Canadian General Investment | 1995.2-2001.12 | Latin American Equity | 1990.8-2001.12 |
| Canadian General Investments | 1994.7-2001.12 | Argentina Fund | 1991.10-2001.12 |
| Mexico Fund | 1988.2-2001.12 | Brazilian Equity | 1992.4-2001.12 |
| Korea Fund | 1990.4-2001.12 | Latin American Discovery | 1992.2-2001.12 |
| Aberdeen Australia | 1988.2-2001.12 | China Fund | 1992.8-2001.12 |
| Italy Fund | 1988.2-2001.12 | Greater China | 1992.9-2001.12 |
| Germany Fund | 1988.2-2001.12 | Jardine Fleming China Region | 1992.9-2001.12 |
| Swiss Helvetia Fund | 1988.2-2001.12 | Japan Equity | 1992.8-2001.12 |
| Thai Fund | 1988.2-2001.12 | First Israel Fund | 1992.10-2001.12 |
| Brazil Fund | 1988.4-2001.12 | Templeton China World | 1993.10-2001.12 |
| Spain Fund | 1988.8-2001.12 | Korea Equity | 1993.12-2001.12 |
| India Growth Fund | 1989.1-2001.12 | Morgan Stanley Africa | 1994.2-2001.12 |
| ROC Taiwan Fund | 1990.11-2001.12 | Morgan Stanley India | 1994.3-2001.12 |
| Austria Fund | 1989.10-2001.12 | India Fund | 1994.2-2001.12 |
| Chile Fund | 1989.10-2001.12 | Jardine Fleming India | 1994.3-2001.12 |
| First Philippine Fund | 1989.12-2001.12 | Southern Africa | 1994.3-2001.12 |
| Turkish Investment Fund | 1989.12-2001.12 | Templeton Russia | 1995.9-2001.12 |
| New Germany Fund | 1990.2-2001.12 | Templeton Emerging Markets | 1988.2-2001.12 |
| Central European Equity Fund | 1990.3-2001.12 | Morgan Stanley Emerging Markets | 1991.11-2001.12 |
| Japan OTC Equity | 1990.4-2001.12 | Emerging Market Telecom | 1992.6-2001.12 |
| New Ireland | 1990.4-2001.12 | Templeton Emerging Markets Appreciation | 1994.7-2001.12 |
| Europe | 1991.8-2001.12 | Z-Seven Fund | 1991.2-2001.12 |
| France Growth | 1990.5-2001.12 | Asia Pacific | 1989.1-2001.12 |
| Thai Capital | 1990.6-2001.12 | Scudder New Asia | 1988.2-2001.12 |
| Singapore Fund | 1990.8-2001.12 | Progressive Return | 1989.11-2001.12 |
| Asia Tigers Fund | 1993.12-2001.12 | Templeton Dragon Fund | 1994.9-2001.12 |
| Morgan Stanley Asia Pacific | 1994.7-2001.12 | Templeton Vietnam and Southeast Asia | 1994.10-2001.12 |

Appendix Table 2a: UK Domestic Closed-End Funds

| | Sample Range | | Sample Range |
|---|---|---|---|
| 3i UK Select | 1981.12-2001.8 | City of London | 1980.1-2001.8 |
| Albany | 1980.1-2001.8 | Dunedin Income Growth | 1980.1-2001.8 |
| Edinburgh | 1980.1-2001.8 | Lowland | 1980.1-2001.8 |
| Finsbury Growth | 1980.1-2001.8 | Merchants | 1980.1-2001.8 |
| Finsbury | 1981.3-2001.8 | Murray Income | 1980.1-2001.8 |
| Fleming Claverhouse | 1980.1-2001.7 | Securities Trust of Scotland | 1980.1-2001.8 |
| Govett Strategic | 1980.1-2001.8 | Temple Bar | 1980.1-2001.8 |
| INVESCO English | 1980.1-2001.8 | Value and Income | 1981.7-2001.8 |
| 3i Quoted Smaller Companies | 1980.1-2001.8 | Henderson Smaller Companies | 1980.1-2001.8 |
| Dresdner RCM Smaller Companies | 1980.1-2001.8 | Perpetual UK Smaller Companies | 1988.2-2001.8 |
| Dunedin Smaller Companies | 1980.1-2001.8 | Throgmorton | 1980.1-2001.8 |
| Gartmore Smaller Companies | 1980.1-2001.8 | | |

| | Sample Range | | |
|---|---|---|---|
| Fleming American | 1985.1-2001.12 | Fleming European Fledgeling | 1990.4-2001.12 |
| F&C US.Smaller Companies | 1992.12-2001.12 | TR European Growth | 1990.7-2001.12 |
| North Atlantic Small Companies | 1985.1-2001.12 | Aberdeen Emerging Economies | 1993.9-2001.12 |
| Baring Emerging Europe | 1993.12-2001.12 | DRES. RCM Emerging Markets | 1993.6-2001.12 |
| Aberdeen Latin America | 1994.10-2001.12 | F&C Emerging Markets | 1987.9-2001.12 |
| Deutsche Latin America | 1994.2-2001.12 | Templeton Emerging Markets | 1989.6-2001.12 |
| F&C Latin America | 1990.7-2001.12 | Baillie Gifford Japan | 1985.1-2001.12 |
| Aberdeen New Thai | 1989.12-2001.12 | Baillie G. Shin Nippon | 1985.7-2001.12 |
| Fleming Indian | 1994.3-2001.12 | Fidelity Japanese Values | 1994.2-2001.12 |
| Gartmore Irish | 1995.5-2001.7 | Fleming Japanese | 1985.1-2001.12 |
| Old Mutual South African | 1994.6-2001.7 | Perpetual Japan | 1993.6-2001.12 |
| Aberdeen New Dawn | 1989.5-2001.12 | Schroder Japan | 1994.5-2001.12 |
| Edinburgh Dragon | 1987.9-2001.12 | Charter European | 1985.1-2001.8 |
| Henderson Far East | 1985.1-2001.12 | Fleming Continental Europe | 1985.1-2001.8 |
| Pacific Assets | 1985.1-2001.12 | F&C Eurotrust | 1985.1-2001.8 |
| Pacific Horizon | 1989.9-2001.12 | Gartmore European | 1985.1-2001.8 |
| Fidelity European Values | 1991.10-2001.12 | Perpetual European | 1989.11-2001.8 |
| Martin Currie Europe | 1990.2-2001.12 | European Assets | 1985.1-2001.8 |
| Merrill Lynch European | 1994.2-2001.12 | | |