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INTERNATIONAL EQUITY FUNDS, PERFORMANCE, AND INVESTOR FLOWS: AUSTRALIAN EVIDENCE*

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Abstract

This is the first paper in the Australian literature to examine the investment performance of actively managed international equity funds (domiciled in Australia). Both institutional and retail international equity funds are assessed together with the impacts of investor fund flows on portfolio returns. Performance is also evaluated using conditional measures that account for public information in the global economy, however, despite an improvement in the measurement of risk-adjusted returns, performance remains consistent with an efficient global market. These findings support prior research, which concludes that active management does not provide investors with superior returns to passive indices. When consideration is given to the liquidity service provided by active managers, fund flows are shown to negatively impact on performance.

JEL classification: G23

Keywords: *INTERNATIONAL EQUITIES; PERFORMANCE EVALUATION; FUND FLOW*

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1. Introduction

The performance evaluation literature concerning managed funds has been extensively addressed internationally, where the empirical evidence widely documents the inability of active funds to outperform market indices (Jensen, 1968; Elton *et al.*, 1993; Malkiel, 1995; Gruber, 1996; Ferson and Schadt, 1996; Cai *et al*., 1997; Blake and Timmerman, 1998; Blake, Lehmann and Timmerman, 1999). Australian research also supports the international evidence (Bird, Chin and McCrae, 1983; Robson, 1986; Hallahan and Faff, 1999, Sawicki and Ong, 2000). However almost all of the empirical research conducted internationally has investigated the investment performance of funds domiciled in the same country or funds that invest in diversified portfolios comprising both domestic and international assets across equity and non-equity securities. In Australia, published research concerning the investment performance of international equity funds offered to Australian-based investors is non-existent. This gap in the Australian literature concerning international equity funds is surprising for two reasons; first, given the size of international equity funds managed by investment managers (more than $A113 billion or around 18 per cent of total assets at 31 December 1999) and second, the significant size of investment opportunities and diversification benefits that arise beyond Australian shores (98.8 percent).[1] Therefore, in light of Australia being a small open-economy (1.2 percent of the world's total capital market), the enormous size of the international equity sector and the absence of empirical investigation in Australia, this study makes an important contribution to the performance evaluation literature. The paper also adds to the literature through the provision of a performance comparison between the two segments of the funds management market – institutional and retail products, and the domicile of the investment management organisation.

Prior studies that have evaluated the performance of active international mutual funds have found that these funds did not outperform appropriate global benchmarks. Cumby and Glen (1990) investigated the performance of actively managed U.S.-based international equity mutual funds and found no evidence of superior performance relative to a global market index through either security selection or market timing ability. Block, Stanley and Sneddon (1989), Eun, Kolondy and Resnick (1991) and Droms and Walker (1994) also report performance for international equity mutual funds that is consistent with an efficient global equity market. Detzler and Wiggins (1997) also find that active international funds did not exhibit superior security selection ability.[2] However, Gallo and Swanson (1996) provide conflicting evidence that is dependent on the type of model applied to U.S.-based international equity mutual funds in the period. These authors also find that when the single index model is used, active funds do not differentiate themselves from an index mimicking strategy whereas the use of a multi-factor model indicates superior performance.

This paper also evaluates the performance of international equity funds using both unconditional and conditional approaches. Ferson and Schadt (1996) argue that the use of the traditional or unconditional performance evaluation techniques can lead to performance measurement biases which arise due to common time variation in managed fund risks and risk premia. All published Australian studies, with the exception of Sawicki and Ong (2000), have relied on the use of unconditional performance evaluation methods, while across other markets the conditional performance approach has not been extended to international equity funds. Accordingly, this study attempts to provide an indication of the level of potential bias

existing between unconditional and conditional methods for active international share funds. The conditional methodology incorporates public information variables in addition to the naive benchmark (market) proxy to provide more accurate inferences concerning the magnitude of abnormal returns – that is returns earned beyond information that is widely available to the public.

This paper also provides evidence concerning the influence of fund flow volumes on active portfolio performance for international share funds. There have been a number of studies that have evaluated fund flows in relation to mutual performance and asset returns. A number of papers have provided empirical evidence concerning the performance-flow relation, (for example, Gruber, 1996; Sirri and Tufano, 1998; Zheng, 1999; and Sawicki, 2000) thereby illustrating that investors re-allocate their funds toward investment managers earning superior returns in a previous period. There have also been other studies investigating the aggregate flows of funds and their impact on asset returns (Warther, 1995; Edelen and Warner, 2000; Froot, O'Connell and Seasholes, 2000). However, prior literature concerning the actual impact of fund flow on performance estimates is non-existent in the Australian literature and limited to one specific paper in the U.S.[3] Edelen (1999) argues that where an active manager, trading in a market in informational equilibrium, experiences an exogenous fund flow shock that is material, underperformance cannot be avoided. Indeed, Edelen (1999) documents that where performance measurement techniques are applied to open-ended funds that ignore the level of uninformed, liquidity-motivated trading activity, security selection and market timing estimates will be adversely affected. Edelen (1999) shows that funds' negative market timing estimates based on traditional performance measures are completely attributable to

fund flow. This paper considers the extent to which fund performance is improved when international share managers are required to engage in trading as a result of investor fund flows.

The remainder of this paper is structured as follows. Section 2 outlines the methodology used in measuring investment performance for international equity funds. Section 3 provides institutional details and describes the data used in the analysis. Section 4 provides a discussion of the empirical results. The final section concludes the paper and suggests further avenues for future research.

2. Methodology

2.1. Performance Measurement – Unconditional Approach

The CAPM-based approach, where risk-adjusted abnormal performance is measured following the seminal work of Jensen (1968), has been used extensively in the performance evaluation literature. Jensen's alpha, capturing the abnormal excess return of active funds, is estimated using ordinary least squares regression, where an active fund's return in excess of the risk-free rate is regressed on the excess return of the market proxy portfolio. The standard excess returns market model regression is therefore expressed as follows:

$$R_{pt} = \alpha_p + \beta_p R_{bt} + \varepsilon_{pt} \qquad (1)$$

where:

R_{pt} = the return of fund p in period t in excess of the risk-free rate;

α_p = the unconditional risk-adjusted return of fund p in the period (Jensen's alpha);

β_p = systematic risk of the fund, measuring the sensitivity of the excess return of fund p to the excess return on the Index;

R_{bt} = the return on the market portfolio in period t in excess of the risk-free rate; and

ε_{pt} = the residual return of fund p in period t not accounted for by the model.

The Jensen (1968) approach, however, does not consider an active investment manager's attempts to outperform the market portfolio through the use of 'timing' strategies. Treynor and Mazuy (1966) proposed the use of a quadratic term in addition to (1), arguing that funds with market timing ability will hold a greater (smaller) proportion of their portfolios in the market portfolio of risky assets when they expect the market to rise (fall). This attribution model decomposes active performance into either security selection or market timing. The intercept term in the Treynor-Mazuy model captures abnormal excess returns attributable to stock selection skill only and successful market timing exists where the coefficient γ is significantly positive:

$$R_{pt} = \alpha_p + \beta_p R_{bt} + \gamma_p R_{bt}^2 + \varepsilon_{pt} \qquad (2)$$

2.2 Performance Measurement – Conditional Approach

Ferson and Schadt (1996) propose the use of conditional performance evaluation methods given that the unconditional approach assumes that risks and risk premia remain constant over time. They argue the failure to account for the time variation in

risks and returns may lead to biases in the evaluation of investment performance. Indeed, Ferson and Schadt (1996) find supporting evidence of negative Jensen alphas more often when an unconditional approach is adopted relative to a conditional methodology. In semi-strong form efficient capital markets, security prices fully reflect all publicly available price sensitive information, however, Ferson and Schadt (1996) argue that the traditional CAPM-based approach ignores the role of publicly available information used in the portfolio management process. Where a portfolio manager incorporates public information within the investment strategy, unconditional models may indicate the fund exhibiting superior risk adjusted performance when in actual fact none exists. Therefore a potential bias exists when traditional performance models are used.

The conditional approach involves an extension to the traditional Jensen (1968) model, where a vector of lagged public information variables are incorporated to estimate alpha that is conditional on the public information they possess. This paper also extends the Ferson and Schadt (1996) model to account for potential valuation-style biases employed by active international share managers:

$$R_{pt} = \alpha_p + \beta_p R_{bt} + \delta_p (R_{bt} x Z_{t-1}) + \varepsilon_{pt} \qquad (3)$$

where:

α_p = the conditional estimate of risk-adjusted performance;

δ_p = measures the response coefficients of conditional beta with respect to lagged public information variables;

Z_{t-1} = the vector of public information variables lagged one period.

Ferson and Schadt (1996) measure conditional alphas for U.S. mutual funds (primarily equity funds) using treasury note yield, dividend yield, term structure of interest rates and a corporate quality yield spread as lagged public information variables as well as including a dummy variable for the month of January. As a result of this paper being concerned with estimating conditional alpha for international equity funds, the conditional model in (3) incorporates all lagged public information variables as outlined by Ferson and Schadt (1996), with the exception of a corporate quality spread variable.[4] While the January anomaly has been extensively documented in domestic stock returns, a dummy variable for January is included as a conditional variable. The conditional performance evaluation method incorporating market timing is an extension of (3) and is estimated as follows:[5]

$$R_{pt} = \alpha_p + \beta_p R_{bt} + \delta_p (R_{bt} x Z_{t-1}) + \gamma_p R_{bt}^2 + \varepsilon_{pt} \quad (4)$$

2.3 Fund Flows and Performance

Edelen (1999) shows that active fund performance for open-end U.S. mutual funds is adversely affected as a result of investment managers being required to engage in uninformed, liquidity-motivated trading. Edelen (1999) further documents that perverse market timing ability can be attributed to the liquidity function these managers provide mutual fund investors. Edelen's (1999) argument follows from the analysis of Warther (1995), who demonstrates a strong positive correlation between aggregate fund flow and market returns using monthly data. Further, Ferson and

Schadt (1996) find that the variation in fund betas are driven by new money flows into mutual funds, which in turn causes a negative relationship between market timing performance and fund flow.

An examination of net fund flows of international share funds used in this study reveals that such funds experience a significant volume of flow. After controlling for extreme cash movements (for example, those flows that occur around the early stages of a funds life), on average funds exhibit net flow volume per month (in absolute terms) equivalent to 6.29 percent of total fund assets (6.82 percent for institutional and 6.11 percent for retail funds). Considering that a fund's gross flows exceed net flows, flow volume would therefore be even more significant. Overall, the average fund, in net terms at least, experiences a material volume of flow in managing their active portfolios, and the extent to which flow impacts on performance is an empirical issue.

This paper evaluates the extent to which the liquidity service managers provide investors affects estimates of risk-adjusted performance using both unconditional and conditional performance evaluation techniques. Net fund flows (NFF) are estimated from monthly international share fund asset values; specifically, total fund assets (TFA) at period *t* minus total fund assets from the previous period *t-1* (after the adjustment for the appreciation/depreciation in period *t-1*). The use of net flows rather than gross flows is intuitive as inflows and outflows may be 'crossed' with one another, meaning that the manager is not required to engage in liquidity-motivated trading.[6] Net fund flows can be expressed algebraically as follows:

(5)

$$NFF_{pt} = TFA_t - [TFA_{t-1}(1+R_{pt})]$$

Extending the unconditional model in (3) with an additional variable accounting for the link between fund flows and market timing, Edelen (1999) advocates the use of an interactive regressor to control for the affect of the volume of fund flow on market timing.[7] From (5), the volume of fund flows are scaled by the monthly fund size to calculate standardized find flow (SFF) (also called normalised fund flow) and incorporated in unconditional and conditional models respectively:[8]

$$R_{pt} = \alpha_p + \beta_p R_{bt} + \gamma_p R_{bt}^2 + \lambda_p (SFF_{pt}) R_{bt}^2 + \varepsilon_{pt} \tag{6}$$

$$R_{pt} = \alpha_p + \beta_p R_{bt} + \delta_p (R_{bt} x Z_{t-1}) + \gamma_p R_{bt}^2 + \lambda_p (SFF_{pt}) R_{bt}^2 + \varepsilon_{pt} \tag{7}$$

The additional flow variable proposed by Edelen (1999) assists in differentiating an active fund's true market timing ability from the uninformed, liquidity-motivated trading function that funds are required to perform. Hence, if flow is adversely captured in the timing coefficient of (3) and (4), the expectation is that (6) and (7) would document an improved timing estimate coupled with a negative coefficient on the interactive flow term. If this is the case, then Edelen's (1999) interactive regressor accounts for the negative timing induced on funds arising from the flow they experience.

3. Institutional Details and Data

3.1 Institutional Details

Table 1 presents summary statistics relating to the size of funds management market in Australia. The total asset size of investments controlled by investment managers was around $A632 billion as at 31 December 1999, of which the international equities sector was valued at $A113 billion (or approximately one-fifth of the total market). In other words, the international equities sector is a significant proportion of the total funds management market and deserves attention as an investment sector in its own right. The asset class category named 'other' represents funds invested in infrastructure, tactical asset allocation assets and miscellaneous investment classes otherwise outside of the asset category classifications.

<<INSERT TABLE 1>>

The funds domiciled in Australia for international equities exposure is highly concentrated across investment managers, which is depicted in Table 2. The ten largest international share managers controlled 60 percent of total assets invested in the sector. Further, the top 3 managers account for more than 25 percent of the sector and only 3 of the 10 largest managers are Australian incorporated organisations.

<<INSERT TABLE 2>>

The most widely referenced market index by investment managers concerning the performance of the international equity market (excluding Australian equity securities) is the Morgan Stanley Capital International World (ex-Australia) Index

(MSCIXA) with gross dividends re-invested. This is a market capitalisation-weighted benchmark that comprises only developed countries (21 excluding Australia). While some countries may be perceived to be 'developed' (e.g. Taiwan or Israel), MSCI considers them to be 'emerging' economies due to either limits or bans on foreign ownership, inadequate securities market regulation, restrictions on capital flows or perceived political risks. The total market capitalisation of securities comprising MSCI World Index exceeds $US21 trillion, where the market capitalisation values for each country comprising the index is exhibited in Figure 1. The regional weights comprising the MSCI World Index are shown in Table 3, together with and the 5 largest countries and their respective index weights over the 11-year period are documented in Figure 2. The North America region, which includes Canada and the U.S., dominates the MSCI World Index, however, the U.S. is responsible for around 49 percent of the total MSCI World Index alone at December 1999. Japan and the UK are the second and third largest markets within the MSCI World Index and represent 13.4 percent and 9.4 percent respectively.

<<INSERT FIGURE 1>>

<<INSERT TABLE 3>>

<<INSERT FIGURE 2>>

The objective of MSCI indices is to provide benchmarks that best represent the opportunities available to institutional investors. Therefore, replicability of the indices is essential. MSCI constructs the country indices by firstly considering the

universe of listed securities and then filtering stocks on the basis of industry classification, liquidity and free float (percentage of shares freely traded). MSCI aims to have 60 percent of listed securities within any industry included in country indices. MSCI also seeks to avoid the indices being misrepresentative due to potential cross-ownership of stocks in the indices. After consideration of these factors, MSCI then weights all securities to be included in the indices in terms of each company's market capitalisation, which helps to ensure objectivity. The construction of the MSCI indices accounts for possible ownership restrictions imposed by some countries (e.g. foreign ownership). All indices constructed by MSCI are considered 'free' in the sense they account for these restrictions to non-domestic investors. MSCI also calculates non-free versions of some indices.

3.2 International Equity Fund Data

This paper uses monthly returns for a sample of 95 active, Australian-based open-end international share funds (29 institutional and 66 retail) in existence within the 11-year period to 31 December 1999. These funds invest exclusively in international equity securities domiciled outside Australia. Monthly performance data was provided by Morningstar Research Pty Ltd. and is reported after management expenses but before tax. Returns are calculated as the total return to investors arising from changes in capital value and income derived from portfolio assets, translated into Australian dollars (i.e. returns include currency appreciation/depreciation).[9] The combined market value of assets of these institutional and retail funds at 31 December 1999 was in excess of $A8.5 billion. To be included in the sample, funds were required to have at least three years of performance history.[10] The advantage of not

applying strict limits on the evaluation horizon helps to ensure a broader cross-section of funds being captured in the performance evaluation period. Constraining the fund sample to only funds with sufficient longevity, as is the case in most managed fund performance studies, leaves the study open to potential selection biases.

One of the strengths of this study compared with other papers is that the analysis does not suffer from survivorship bias - that is, funds are not excluded from the sample in cases where data is not continuous through until the end of the evaluation period, in this case December 1999. Brown, Goetzmann, Ibbotson and Ross (1992) and Elton, Gruber and Blake (1996) highlight the problems performance evaluation studies face where survivorship bias exists. The major effect is that performance is likely to be overstated where only surviving funds are included, as poor performers have higher probabilities of attrition. The use of a survivor-free sample avoids these limitations and provides for more accurate inferences concerning fund manager performance.

3.3 Measurement of Public Information Variables

Ferson and Schadt (1996) advocate the use of conditional performance evaluation models to control for (a) the level of public information available to active managers and (b) to minimise the potential biases inherent in traditional or unconditional methods. In this study, conditional performance is assessed with the inclusion of 3 lagged (*t-1*) public information variables similar to those identified by Ferson and Schadt (1996), yet applicable to an international equity setting. The first information variable is the lagged 30-day treasury note yields of the 5 largest countries (U.S., Japan, U.K., Germany and France) comprising the MSCIXA with respect to their

market capitalisation weights in the MSCIXA over the 11-year period to December 1999. Because these economies dominate the index in terms of their size and influence, this approach should provide a good international proxy.[11] Second, a lagged measure of the term structure, expressed as the monthly difference in yield between long-term bonds and short-term treasury notes was obtained using Datastream for these 5 largest countries, and the MSCIXA weights were similarly applied as outlined above. Third, a lagged measure of dividend yield for the MSCIXA was provided by MSCI, which is a market capitalisation-weighted measure across all constituent countries of the MSCIXA.

4. Empirical Results

Tables 4 to 6 document the overall risk-adjusted excess returns, security selection and market timing abilities of active international equity funds across both institutional and retail (after management fees) universes in the 11-year period to December 1999. The evidence overwhelmingly indicates that the average active fund does not outperform the MSCI World (ex-Australia) index. These conclusions are independent of whether performance is measured using a performance model that either accounts for or ignores fund flow.

Table 4 indicates that institutional funds earn risk-adjusted excess returns after expenses which are comparable to an index fund. The average alpha for institutional funds is insignificantly different from zero. Retail funds, on the other hand, levy higher management expense ratios than institutional funds, and *ceteris paribus*, will be expected to underperform institutional funds to a greater extent after expenses.

Management expense ratios of 7.9 basis points per month are levied for actively managed global equity funds offered to institutional investors (Mercer Investment Consulting, September 1999) whereas their retail counterparts levy management expense ratios in the order of 17.6 basis points per month (Morningstar, June 1999). This suggests that the level of underperformance of both retail and institutional funds is approximately equal to the average management expense ratio. An interesting point to note is the distribution of international share fund alphas for both institutional and retail funds. More than 50 percent (75 percent) of institutional funds (retail funds) exhibit risk-adjusted performance estimates less than zero across both unconditional and conditional approaches. However there exists less variability across alphas when the conditional model is used to account for risk. On average, these results indicate the futility of active management in the international equity sector.

<<INSERT TABLE 4>>

Tables 5 and 6 present the performance attribution results for security selection and market timing for the institutional and retail international equity fund samples respectively. The results derived from the Treynor-Mazuy model show that active international equity funds, on average, do not provide investors with superior returns to the MSCI World (ex-Australia) Index through either market timing or stock selection strategies. These results are again consistent with the literature spanning other investor markets. Of particular note is the improvement in the performance of institutional stock selection ability when fund flow is accounted for, although fund returns remain insignificantly different from the benchmark.

The unconditional and conditional models account for fund flow arising from uninformed, liquidity-motivated trading within the benchmark. As a result, the model separates the underperformance arising from fund flow that is not attributable to trading behaviour that arises from informed activity. In the institutional sphere, this translates into an 11.7 basis point performance differential, on average, where the conditional performance evaluation model is applied. In other words, institutional funds exhibit improved fund performance attributable to security selection when fund flows are accounted for in risk models. While this is consistent with Edelen's (1999) results, where an unconditional model is used, institutional funds in this study do not appear to record any material improvement in market timing ability. When fund flow impacts are measured in the retail fund sample, average alphas are similar to those derived in the models that ignore flow. However, the fund flow variable lambda (λ) is significantly negative when the conditional model is applied, which is consistent with the institutional sample. Adjusted mean R^2 figures relating to our models describing institutional fund performance range from 0.733 to 0.767 and 0.648 to 0.664 for the retail sample depending on which model is used.

<<INSERT TABLES 5 AND 6>>

5. Conclusions

This is the first study that evaluates the performance of actively managed international equity funds offered to Australian investors, as well being the first study to examine the impact that investor fund flows have on estimates of performance in the sector.

Overall, the results are consistent with the prior literature spanning other investor markets that active international equity funds do not earn superior risk-adjusted returns. The paper also provides evidence of fund flow activity inhibiting investment performance for both institutional and retail funds. However, fund flows alone are not able to account for the inability of active international share managers to outperform passive indices. The findings documented in this paper raise questions as to why active managers are unable to outperform. There exist a number of plausible reasons, including whether net fund flows substantially underestimate the true impact of uninformed trading behaviour of active managers. Secondly, the issue of whether the proxy benchmark is an appropriate yardstick with which to measure international equity managers should be considered. That is, does the MSCI index accurately reflect both the investible universe of securities and the investment activities of fund managers? There is likely to exist a greater level of diversity in investment styles and portfolio holdings across international managers than is the case with domestic equity managers. And lastly, the extent to which active international equity manager's have been affected by regional allocations and currency exposures would also be fertile grounds for future research. In particular, can the poor performance of the Japanese equity market coupled with the strength of the U.S. economy over much on the 1990's explain why the underperformance in global equity portfolios is so pronounced.

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Table 1 – Funds Under Management by Professional Investment Managers in Australia at 31 December 1999.

Asset Class	$A Millions	Percentage (%)
Australian Equities	165,436	26.2
International Equities	113,888	18.0
Australian Fixed Interest	109,049	17.2
International Fixed Interest	18,435	2.9
Property	68,377	10.8
Cash	85,128	13.5
Other	72,032	11.4
TOTAL	**632,345**	**100.0**

Source: Rainmaker Information Services

Table 2 – 10 Largest International Share Managers Domiciled in Australia as at 31 December 1999

Rank	International Share Manager	$A billions	Market Share (%)
1	State Street Global Advisors	12.81	11.25
2	BT Funds Management	9.28	8.15
3	Lend Lease Investment Management	7.89	6.93
4	Lazard Freres Asset Management Pacific	6.00	5.27
5	Barclays Global Investors Australia	5.94	5.22
6	Deutsche Asset Management Australia	5.82	5.11
7	AMP Asset Management Australia	5.59	4.91
8	Vanguard Investments Australia	5.50	4.83
9	Queensland Investment Corporation	5.44	4.78
10	Fidelity Investments Australia	4.09	3.59
-	Other International Share Managers	45.53	40.0

Source: Rainmaker Information Services

Table 3 – MSCI World Index Regional Weights as at 31 December 1999

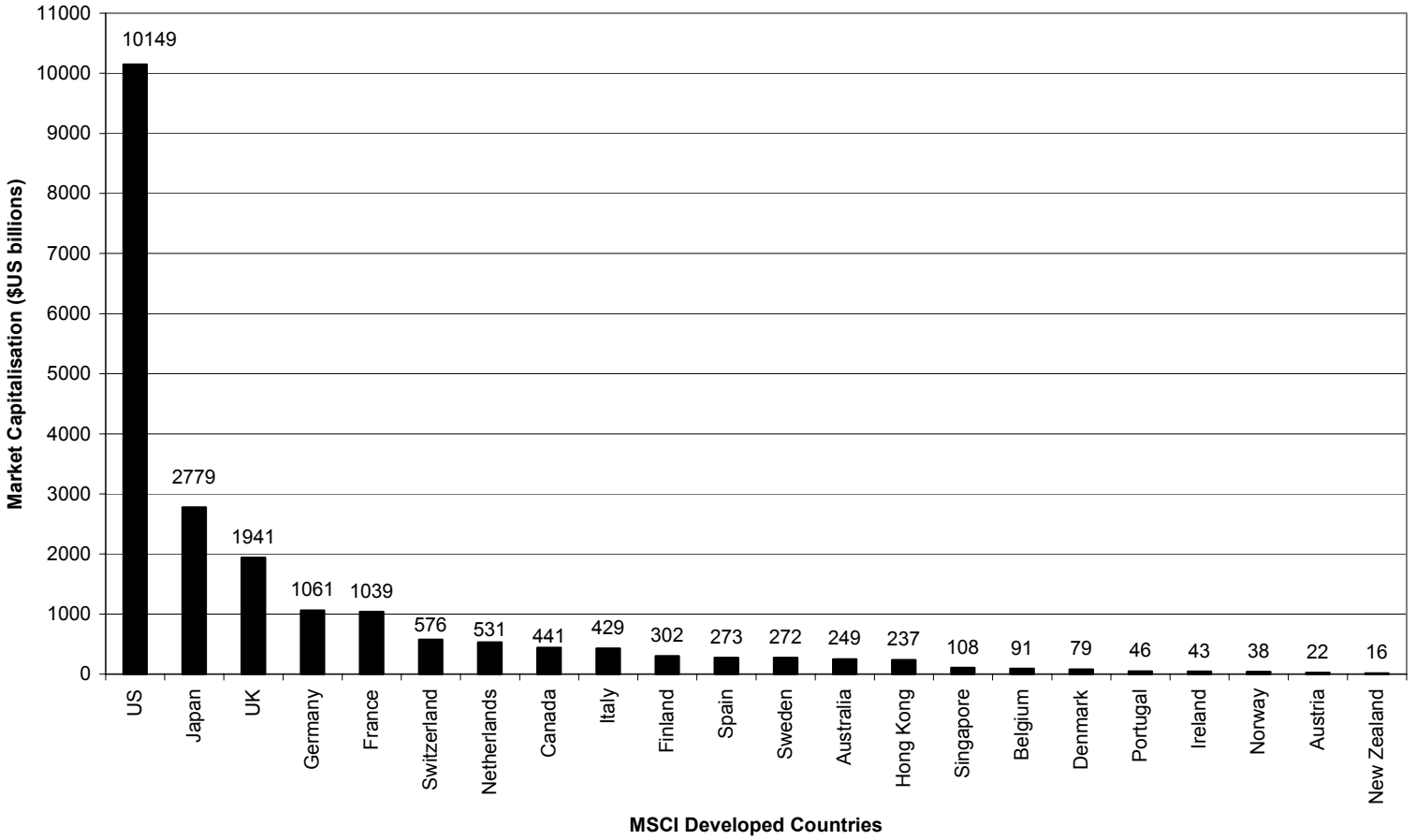
MSCI World Index – Major Regions	Weight (%)
North America	51.1
UK	9.4
Europe (ex-UK)	23.2
Japan	13.4
Asia (ex-Japan)*	2.9
Emerging Markets**	0.0
Total	100.0

Source: Barclays Global Investors and MSCI

* Includes Australia, Hong Kong, New Zealand, Singapore.

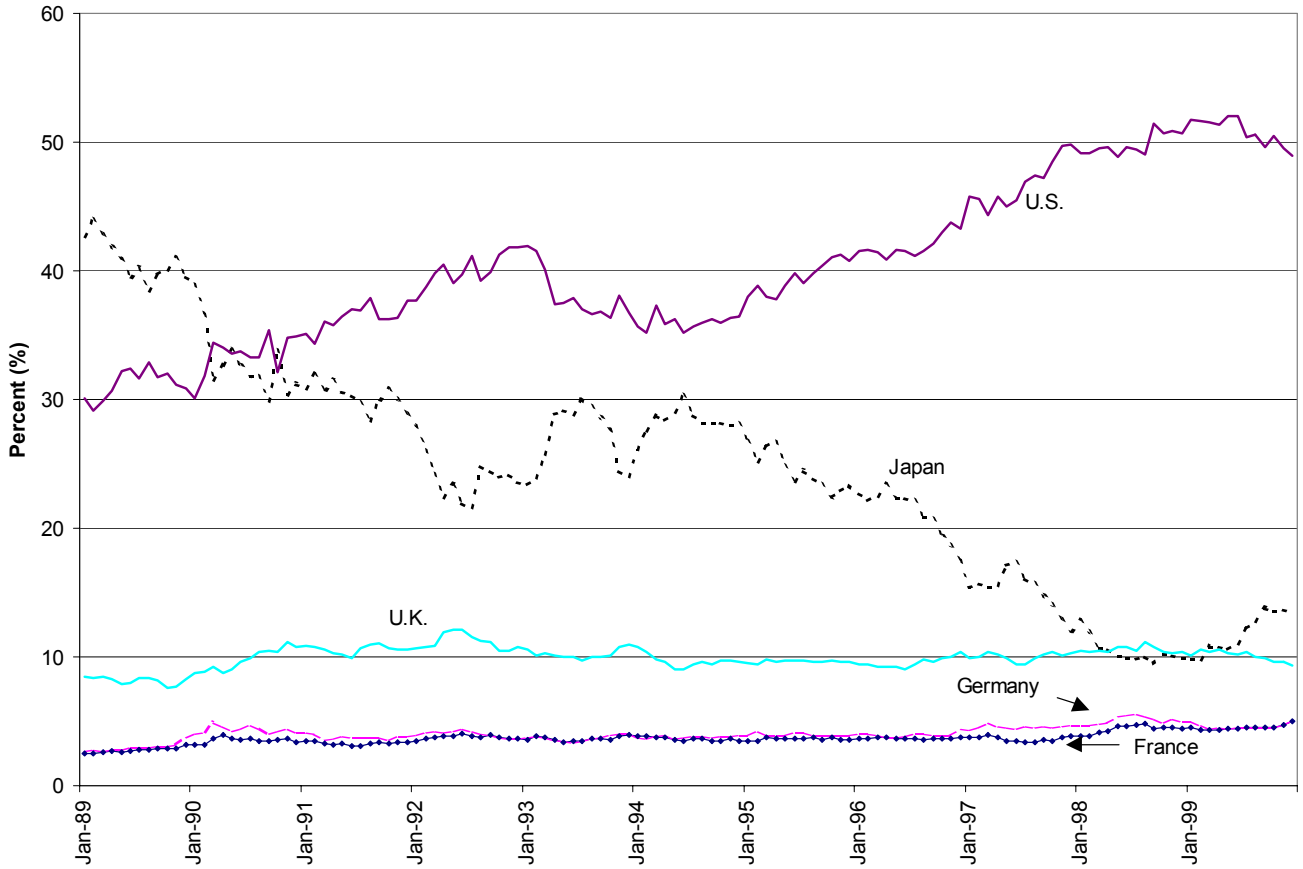
** Emerging Markets not included in the MSCI World Index

Figure 1 – MSCI World Index Country Market Capitalisations ($US billions) as at 31 December 1999



Source: Barclays Global Investors and MSCI

Figure 2 – The 5 Major Developed Countries Comprising the MSCI World Index and Respective Market Capitalisation Weights for the 11 Years to December 1999



Source: MSCI and Barclays Global Investors

Table 4 – Risk Adjusted Performance of Active International Equity Funds in the 11-Year Period to December 1999 (alpha expressed in percentage terms per month)

	Mean α	*t*-stat	SD α	Min α	Q1 α	Q2 α	Q3 α	Max α	Mean β	Mean R^2
Panel A: Institutional Funds										
Unconditional	-0.089	-1.78	0.279	-0.647	-0.260	-0.132	0.023	0.717	0.880	0.741
Conditional	-0.053	-1.25	0.235	-0.470	-0.210	-0.064	0.049	0.545	0.886	0.750
Panel B: Retail Funds										
Unconditional	-0.200	-6.08 ***	0.280	-1.286	-0.306	-0.156	-0.029	0.322	0.715	0.655
Conditional	-0.210	-7.07 ***	0.252	-1.075	-0.346	-0.190	-0.047	0.398	0.921	0.656

*** Significant at 0.01 level
Conditional R^2 is the adjusted R^2

Table 5 – Institutional International Equity Fund Performance in the 11-Year Period to December 1999 expressed in percentage terms per month.

	Mean	t-stat	SD	Min	Q1	Q2	Q3	Max
Panel A: Unconditional Performance Methodology (ignoring fund flow)								
α	-0.024	-0.35	0.378	-0.718	-0.289	-0.078	0.166	0.976
γ	-0.003	-0.92	0.017	-0.061	-0.011	0.002	0.008	0.027
R^2 Adj	0.733							
Panel B: Unconditional Performance Methodology (accounting for fund flow)								
α	0.059	0.55	0.593	-0.842	-0.319	-0.037	0.442	1.793
γ	-0.006	-1.82	0.020	-0.058	-0.018	-0.003	0.008	0.031
λ	-0.008	-0.95	0.048	-0.104	-0.041	-0.007	0.009	0.119
R^2 Adj	0.755							
Panel C: Conditional Performance Methodology (ignoring fund flow)								
α	-0.027	-0.44	0.340	-0.531	-0.224	-0.106	0.140	0.703
γ	-0.001	-0.43	0.019	-0.068	-0.012	0.003	0.010	0.025
R^2 Adj	0.746							
Panel D: Conditional Performance Methodology (accounting for fund flow)								
α	0.090	0.75	0.674	-0.889	-0.296	-0.102	0.498	1.986
γ	-0.004	-0.82	0.026	-0.079	-0.013	-0.001	0.011	0.049
λ	-0.017	-1.95 *	0.046	-0.126	-0.046	-0.009	0.003	0.096
R^2 Adj	0.767							

* Significant at 0.10 level
Adjusted R^2 is the mean adjusted R^2 for the sample.

Table 6 – Retail International Equity Fund Performance in the 11-Year Period to December 1999 expressed in percentage terms per month.

	Mean	*t*-stat	SD	Min	Q1	Q2	Q3	Max
Panel A: Unconditional Performance Methodology (ignoring fund flow)								
α	-0.185	-4.74 ***	0.317	-1.367	-0.286	-0.104	0.007	0.285
γ	-0.002	-1.28	0.014	-0.057	-0.013	-0.003	0.007	0.039
R^2 Adj	0.648							
Panel B: Unconditional Performance Methodology (accounting for fund flow)								
α	-0.221	-4.05 ***	0.442	-1.407	-0.361	-0.176	0.011	0.798
γ	-0.002	-0.72	0.018	-0.061	-0.012	-0.005	0.008	0.050
λ	-0.002	-0.37	0.051	-0.262	-0.015	-0.002	0.014	0.164
R^2 Adj	0.652							
Panel C: Conditional Performance Methodology (ignoring fund flow)								
α	-0.209	-6.27 ***	0.282	-1.049	-0.348	-0.207	-0.036	0.374
γ	0.000	-0.15	0.017	-0.066	-0.013	-0.001	0.011	0.055
R^2 Adj	0.658							
Panel D: Conditional Performance Methodology (accounting for fund flow)								
α	-0.210	-3.93 ***	0.435	-1.447	-0.346	-0.165	0.007	0.898
γ	-0.004	-1.59	0.021	-0.072	-0.014	-0.005	0.006	0.070
λ	-0.013	-2.30 **	0.043	-0.226	-0.016	-0.005	0.007	0.053
R^2 Adj	0.664							

** Significant at 0.05 level
*** Significant at 0.01 level
Adjusted R^2 is the mean adjusted R^2 for the sample.

ENDNOTES

[1] Where size of investment opportunities is defined in market capitalisation terms. The market statistics cited are provided by Rainmaker Information Services, Barclays Global Investors and Morgan Stanley Capital International. The asset weighting to international equities of 18.0 percent compares to 26.2 percent of assets being invested in domestic equities.

[2] Both Detzler and Wiggins (1997) and Cumby and Glen (1990) highlight the possible problems of benchmark inefficiency for global benchmarks and their impact on portfolio performance.

[3] U.S. studies evaluating the relationship between performance and aggregate fund flows (rather than individual fund flows) include Warther (1995), Ferson and Schadt (1996), Edelen and Warner (2000). Edelen (1999) is the sole paper evaluating fund flow impacts in U.S. equity mutual funds.

[4] Outside of the U.S., high-yield markets are not as well developed or indeed in existence. Accordingly, at the international level, the variable is excluded from the analysis. Details about our conditioning variables are provided in section 2.3.

[5] Consistent with Ferson and Schadt (1996), heteroskedasticity-consistent *t*-statistics are calculated. The White (1980) measure is used to correct for heteroscedasticity.

[6] This 'crossing' will depend on the frequency and magnitude of the flow relative to the total size of the fund.

[7] Edelen (1999) uses gross flows, however such data was not available for use in this paper and subsequently relies on net flows of funds. Accordingly, net flows may not capture in entirety the affects of flow on market timing performance. However, the use of monthly data would help to mitigate this mis-measurement problem.

[8] Extreme values of fund flows relative to total fund assets (scaled or normalised flow) are removed from the sample. For example, extreme values typically arise in the early stages of a fund's life, where rapid asset growth can be significant.

[9] International equity funds do not generally hedge international equity assets, and as a result, the MSCI World (ex-Australia) Index is measured as an unhedged index (converted back into Australian dollars). Additional diversification benefits typically accrue through unhedged currency exposure.

[10] This criteria helps to ensure estimates of risk-adjusted performance are not significantly influenced with the start-up phase of the fund and that reliable estimates are achieved measuring risk-adjusted performance.

[11] Indeed, there is little difference between using the largest 5 countries in the MSCIXA as the public information variables and including all countries in terms of their market capitalisation weights.