MUTUAL FUND PERFORMANCE IN TRINIDAD AND TOBAGO

by

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Presented at the 26th Annual Review Seminar
Research Department
Central Bank of Barbados
July 26-29, 2005

ABSTRACT

Mutual funds Performance in Trinidad and Tobago

The mutual fund industry in Trinidad and Tobago has experienced spectacular growth in the recent past, which has catapulted the issue of mutual fund performance measurement and evaluation into prominence in the financial sector. Performance evaluation is critically important to the future growth and development of the sector because mutual funds' past performance is perceived as strongly related to future performance and therefore a major determinant of investors' choice between mutual funds or the choice between a mutual fund and some other investment alternative. This has also attained prominence due to the perception that mutual fund returns are calculated in very subjective and arbitrary ways, which are susceptible to being manipulated to give an overly positive and biased picture of performance. Credible, objective and accurate performance evaluation is also important to all major stakeholders in the fund based on their incentive structures. In spite of the growing importance of these issues there has been little or no research on these issues in the Caribbean. This paper attempts to fill this gap by evaluating the performance of individual growth and income mutual funds in Trinidad and Tobago using risk adjusted performance measurement methods to determine whether funds outperformed the market benchmark and to distill some policy recommendations for appropriate performance measurement and evaluation standards.

1.0 INTRODUCTION

The strong growth in the mutual fund sector in Trinidad and Tobago has catapulted the issue of mutual fund performance and performance measurement into prominence in the financial sector. The growth in the mutual fund sector has been nothing short of phenomenal. In December 2001 funds under management stood at TTS$ 9.1 billion this increased to TT$ 25.4 billion by March 2005. The growth of the sector together with emerging problems in the mutual funds sector in other parts of the World, including developed markets, has increased concerns about the health of the sector, which has in turn focused attention on the performance of mutual funds, transparency in performance measures and objective measures of performance, since past performance is a major determinant of investors' decision on which funds to invest.

The very rationale for the existence of mutual funds is also tied to the performance of funds. Mutual funds have helped small investors to diversify in a certain risk class and enjoy the benefits of investing in a broad range of assets through professional asset managers. The implicit assumption is that these funds can earn a premium on the benchmark portfolio of assets. This is particularly relevant for growth and income funds in Trinidad and Tobago, which sometimes advertises spectacular returns. In other words, mutual funds would not be adding value if they could not earn a risk adjusted return that was either similar to or higher than the market or benchmark portfolio. Research on mutual fund performance has focused on two main areas. The first area focused on whether mutual funds outperformed the market on a risk adjusted basis and on which performance measure could be used to accurately identify market timing and selectivity skills. The second area focused on the reasons driving performance. The focus of this study is in the first area of performance evaluation and measurement.

Performance measurement and evaluation is critically important for a successful mutual funds sector for a variety of reasons. The managers of the fund would like to track the performance of the fund to determine whether their investment strategies are successful, investors would like to have performance benchmarked so they could make informed decision on investment alternatives and the regulators would like to have a sense of how individual funds as well as the sector are performing to determine if there are insolvency risks emerging. Despite the size of the industry and its growing importance in Trinidad and Tobago, little or no work has been done to track or evaluate the performance of mutual funds on a *risk-adjusted* basis. This issue of accurate performance measurement and valuation is particularly relevant to growth and income funds that trade on their advertised ability to earn high returns for investors. This paper seeks to fill this gap by evaluating the performance of individual growth and income mutual funds in Trinidad and Tobago. The paper will therefore be structured as follows: Section 1 is the introduction; Section 2 will review the literature on mutual fund performance; Section 3 will review the stylized facts on mutual funds growth and development; Section 4 will outline the different methodologies for the measurement of mutual funds performance and will evaluate the performance of mutual funds; and Section 5 concludes with some recommendations.

2.0 LITERATURE REVIEW

The central issue in the evaluation of the performance of mutual funds is the determination of the value added by the mutual funds. That is, if investors can achieve a better risk-adjusted return by investing in a set of assets equivalent to that of the mutual fund's portfolio, then the mutual funds adds no value. In this context, the starting point for all mutual funds from which performance can be evaluated is the average risk adjusted return on its benchmark portfolio. The fund must either equal or surpass this benchmark to be considered a worthy investment alternative.

The simplest way of adjusting returns for risks is to benchmark the returns of a fund with that of the returns of similar funds, that is, funds in a similar risk class. The ranking that is generated by this benchmarking can, however, be misleading since the determination of the class of funds against which to compare the fund in question is difficult because of the complexities related to accurately classifying the style of funds. A more precise means to adjust returns for risks is therefore needed. Methods of performance evaluation based on asset pricing models soon emerged to meet this need. Treynor (1965), Sharpe (1966) and Jensen (1968) were among the earliest to recognize the usefulness of asset pricing models for rating performance. The performance evaluation methods developed by these three authors all have some appeal but all suffer from some weaknesses[1] which have spurned numerous studies over the years geared to making refinements and improvements on these models.

In what follows we review the traditional performance measures and the methods developed over time to improve mutual fund performance evaluation. The traditional risk adjusted performance evaluation methods include the Sharpe, Treynor and Jensen measures. The Sharpe measure is calculated as the ratio of the average portfolio excess returns to the standard deviation of portfolio returns over a particular period of time. It therefore measures excess returns per unit of **total** risk. Algebraically this can be expressed as:

1. $$\left(R_p - R_f\right)/\sigma_p$$

where R_p is the average return on the portfolio, R_f is the average risk free rate and σ_p is the standard deviation of the portfolio. The Treynor measure is the ratio of excess returns to beta and therefore measures excess returns per unit of systematic risk. This can be expressed as:

2. $$\left(R_p - R_f\right)/\beta_p$$

where β_p is the portfolio's beta (that is the risk that cannot be diversified away by adding extra securities to the fund) derived from the capital asset pricing model (CAPM). The Treynor measure is appropriate when the fund is part of a larger investment portfolio. Most studies using the Sharpe and Treynor ratios to rank fund performance generate the same ranking because σ_p and β_p are highly correlated (Shawky 1982).

[1] All performance measurement measures based on the asset pricing framework suffer from the intrinsic problems related to this framework such as the fact that the assumptions underlying the framework may often be inappropriate or inaccurate.

The Jensen measure (alpha) is the difference between the excess return of a portfolio and the excess return of the market. If the fund outperformed the market the Jensen alpha would be positive and it would be negative if the market outperformed the fund. The generic version of the CAPM can be expressed as:

3. $$R_p = R_f + \beta_p\left(R_m - R_f\right)$$

where R_m is the average return on the market portfolio. This can be interpreted as the fund return being equal to the risk free rate plus a risk premium that depends on the extent to which the fund returns change relative to the variability in the underlying market return. Jensen measure essentially uses the CAPM to isolate the difference in performance between the fund and the market. This is done by augmenting the CAPM formula with an additional coefficient which represents the extent to which actual portfolio returns actually differ from that predicted by the CAPM. This can be expressed as:

4. $$R_p = R_f + \alpha_p + \beta_p\left(R_m - R_f\right)$$

where α_p is the CAPM or Jensen alpha. This can be manipulated algebraically to represent the linear regression form:

5. $$R_p - R_f = \alpha_p + \beta_p\left(R_m - R_f\right) + e$$

where Jensen alpha is obtained as an estimate of α_p in the above equation.

While the Sharpe ratio is very popular among professional asset managers because it is an appropriate risk adjusted measure for overall portfolios[2] and it utilizes easily available data inputs, it is difficult for some investors to interpret in a relative sense since it is not easily conceptualized as a rate of return. That is, if one portfolio is 0.5 higher than an alternative we know that it has a higher risk adjusted performance but what does this mean precisely in terms of returns. The M^2 ratio (Modigliani and Modigliani 1997), which is the Sharpe ratio scaled by the standard deviation of the benchmark return, corrects this problem because it can be easily interpreted as a differential return relative to a benchmark portfolio. Algebraically, the M2 ratio is:

6. $$M^2 = \left(S_p - S_m\right)\sigma_m$$

where S_p, S_m and σ_m are the Sharpe ratio for the portfolio, the Sharpe ratio for the market return and the standard deviation of the market return respectively.

A problem that affects both the Sharpe and the M^2 ratios, however, is that the standard deviation is used as the measure of total risk and this is not the best measure of risk when the return distribution of the portfolio is skewed. Moreover, the standard deviation treats both positive and negative returns the same way implying increasing returns are risky which is counterintuitive. This is not a problem if the distribution of the returns is normal but it is if the returns are non-normal or if the investor has a target return that is different to the mean portfolio return. One way of dealing with the potential problem of not focusing on the negative returns or the downside risks (the risks managers are concerned about) is to use downside risk instead of total risks in the risk adjusted performance measure. The Sortino ratio accomplishes this by replacing the total risk used in the Sharpe ratio with downside risk which provides an appropriate measure for managers primarily concerned with downside risks. The Sharpe ratio is also inadequate if the investment manager has an active strategy designed to exceed the benchmark return. In this case the important factor is the returns to the portfolio over the benchmark return, relative to the benchmark risks taken, as measured by the tracking error. The Information Ratio (also called the Appraisal Ratio) does this by providing a measure that tracks incremental return over the benchmark given the benchmark relevant return taken to earn it. The Information Ratio can therefore be defined as:

7. $$\alpha_p / \sigma\left(e_p\right)$$

where α_p is the alpha of the portfolio and $\sigma\left(e_p\right)$ is the nonsystematic risk of the portfolio or the "tracking error". It measures above average return per unit of risk that can be diversified away by holding a market portfolio. The information ratio is often used as a measure of the ability of the active manager. The M^2, Sortino and Information ratios are all derived from the Sharpe ratio but all seek to correct some weakness in this risk adjusted performance ratio.

In terms of the Jensen alpha it provides an easily interpreted performance measure (excess returns in percentage terms) and it can also be easily estimated from a CAPM equation that can be evaluated by the full range of statistical tests. The Jensen measure is, however, subject to a number of potentially serious problems. It is subject to the criticisms leveled against asset pricing models such as inappropriate assumptions[3] (Leland 1999), its reliability is dependent on the benchmark relevance to a particular portfolio (Roll 1980, Lehmann and Modest 1987, Grinblatt and Titman 1994) and that problems such as the timing ability of asset managers can make performance evaluation difficult because it violates the condition of constant mean and variance of asset returns (Jensen 1972, Admati and Ross 1985, grinblatt and Titman 1989). There is also the issue of whether a single or multi factor model is more appropriate and whether other factors other than benchmark indices such as fund size should be included in the CAPM equation (Carhart 1997).

In addition to the performance measures outlined above, there is a range of issues related to performance evaluation that impact on the accuracy of this process and must be ventilated. One of the most serious issues in mutual fund performance evaluation is the notion of the statistical significance of the performance evaluation measures. The first issue in this regard is the adequacy of the historical data on returns. If the series on returns is short we are less confident of the validity of the results, or to put it another way we cannot make statistical inference

[2] The appropriate measure of portfolio performance depends critically on whether a particular portfolio is part of or the entire investment holding of the investor.

[3] The assumption include that all asset returns are normally distributed and investors care only about mean and variance of returns, implying that investors give equal weight to upside and downside risks.

confidently because the information is inadequate. In the investment management business the high variance of returns also compounds this problem of statistical significance in the face of short data series.

Moreover, in most cases we assume that returns are distributed with constant mean and variance. In the context of mutual funds, it may be reasonable to assume that the return distribution in funds where managers pursue a passive strategy have constant mean and variance. In funds where the manager has an active strategy and return distributions change by design, however, the assumption of constant mean and variance would be inappropriate and could lead to substantial errors in performance measurement and evaluation. The assumption of constant mean and variance is also inappropriate when investment managers can time the market. Market timing involves shifting funds between a safe asset like treasury bills and a market portfolio depending on when the market is expected to outperform the safe asset. In these cases the traditional mean variance performance measures without enhancements are inadequate because they cannot capture the dynamic of changing portfolios and could produce erroneous and misleading inferences (Grinblatt and Titman 1989). Some authors have, however, developed methodologies to mitigate these challenges, which can fit in the asset-pricing framework and specifically in the context of the Jensen method (Treynor and Mazuy 1966, Henricksson and Merton 1981 and Elton and Gruber 1991).

When a fund manager successfully engages in market timing the fund increases its exposure on the upside and decreases it in the downside. This alters the linear relationship between portfolio and market returns. The new relationship is convex when timing is successful and concave when it fails. Treynor and Mazuy (1966) used this feature to augment the single factor Jensen model with a coefficient to capture market timing and meliorate the problems that could be caused by not accounting for it. This model is outlined below:

8. $$R_p - R_f = \alpha_p + \beta_p\left(R_m - R_f\right) + \delta_p\left(R_m - R_f\right)^2 + e$$

where δ_p turns out to be positive, this indicates successful market timing, because this will make the characteristic line steeper as the excess return on the market portfolio is larger.

Merton (1981) and Merton and Henriksson (1981) also try to deal with managers' ability to time the market by developing a two state framework for performance evaluation. In this framework the fund manager attempts to forecast whether the fund return would be higher or lower than the risk free rate, he then adjusts his asset allocation between two discrete levels of systematic risk depending on market conditions. The index model of fund performance could then be expanded to include a coefficient that captures this reality, with a positive coefficient signaling market timing. This model is outline below:

9. $$R_p - R_f = \alpha_p + \beta_p\left(R_m - R_f\right) + \delta_p\left(R_m - R_f\right)D + e$$

where D is a dummy variable that is 1 when $R_m > R_f$ and zero otherwise. A positive value of δ_p indicates successful market timing. The beta on the portfolio is therefore β_p in a bear market and $\beta_p + \delta_p$ in a bull market.

The Treynor and Mazuy and the Merton and Henriksson models have a serious drawback, that is, they can incorrectly indicate timing ability in the presence of co-skewness between the fund and benchmark returns. Connor and Korajczyk (1991) deal with this problem by including in the model the costs of options used for gaming performance. Bhattacharya and Pfleiderer (1983) also address the timing issue by evaluating the error process of index models to quantify timing ability. Grinblatt and Titman (1994) also developed the positive period weighting measure to deal with this problem. This measure is simply the period by period excess returns on a particular portfolio and once certain conditions are imposed on the weights this measure does not suffer from the problems faced by the Jensen model. The problem in this framework is the infinite set of weights that can satisfy this measure.

The results from the empirical literature on mutual fund performance have been largely negative. In most cases, studies have indicated that funds under-performed or mirrored the performance of the market benchmark (Jensen 1968, Gruber 1996, Malkiel 1995, Daniel et. al. 1997, Bogle 1998). Gruber (1996) in a study of the US mutual fund industry shows that funds under-performed the market index by between 65 and 194 basis points depending on the index. Daniel et al. (1997) found that active managers even if they earned returns above the passive (market) benchmark could not cover their expenses with this excess. In other words, they under-performed the market when returns were evaluated net of expenses. Bogle (1998) also found a negative relationship between fund performance and expense ratios. On the other hand, Ferson and Schadt (1996) and Ferson and Warther 1996) argue that this under-performance is based on misspecified models in which the relevant expectations are not conditioned on publicly available information variables. Kathari and Warner (2001) further argue that the results may be inaccurate because standard performance measures depend on the ability of the benchmark to mimic the fund investment style. Benchmarks must, therefore be chosen carefully to avoid problems with the evaluation of performance.

In spite of these potential problems the single and multiple index models based on the Jensen (CAPM) framework remain the basis for the majority of empirical work on mutual fund performance. This is so because this framework provides a clear, statistical testable framework for risk adjusted performance evaluation. Moreover, the above review indicates that there are many ways of dealing with the problems encountered in the use of simple single and multiple index models for mutual fund performance evaluation. This is therefore the framework that is used in the study for the empirical analysis of mutual fund performance.

3.0 STYLISED FACTS IN THE MUTUAL FUNDS SECTOR IN TRINIDAD AND TOBAGO

The mutual funds sector in Trinidad and Tobago had its genesis in 1982 when the Unit Trust Corporation (UTC) was set up. The UTC registered TT$ 36 million sales in its First Unit Scheme (FUS). This scheme subsequently registered weak growth as sales slumped to TT$ 1.4 million in 1984 driven by negative growth in the real economy. The fiscal incentives in the 1986 budget helped boost sales to TT$ 12.5 million in that year in spite of continuing poor growth. The introduction of the Second Unit Scheme (SUS) in 1989 virtually eliminated the risk of capital depreciation[4] and significantly boosted total sales.

The success of the UTC now meant that it effectively competed with banks for funds. The banks responded by setting up mutual funds of their own beginning in 1993 to tap into this growing market. They also lobbied heavily to level the playing field, especially with respect to the preferential tax treatment granted to the UTC. In 1994, the government signaled its intention to level the playing field and in 1996 all the tax incentives for the UTC was discontinued except for its exemption from corporate income tax. By 2001, mutual funds managed by banks numbered nine. The mutual funds industry in Trinidad and Tobago by the end of 2001 was comprised of 11 mutual funds with aggregate investments of over TTS 9 billion. Total funds under management have since grown dramatically and now stand at approximately TT$25.4 billion by the end of March 2005 (See Table 1).

The performance of the growth and income funds mirrors the changes in value to their stock of equities, which form the major part of their asset portfolio. It also reflects changes to the tax regime for these funds and the attractiveness of alternatives. In terms of the performance of the local money market mutual funds, the main factors driving their overall return would reflect the underlying condition in the money market and the fixed income securities generally, especially with respect to interest rates. These rates have generally been higher in the last decade but interest rates have generally fallen since 2000 and are only now starting to recover. Money market funds also have the favorable combination of relatively high rates of return, less volatility and a very small risk of capital loss. This last factor in particular has contributed to the substitution of money market mutual funds for income and growth funds in the past whenever equity markets deteriorated. The returns on money market funds have been below that of the equity based income and growth funds, especially when equity markets are buoyant as they have been up to 1998. The money market funds have grown considerably, however, especially after 1998 when international equities markets weakened and as interest rate rose. This was based in part on the flight of investors to the relatively safe and stable money market funds. This could change, however, if the low interest rates persist for some time.

[4] Capital loss due to soft stock prices was a significant factor that hampered the growth of the First Unit Scheme. The investment mix of the Second Unit Scheme by minimizing this possibility attracted many investors, especially those who were very risk averse.

Table1
Total Funds Under Management in the Mutual Funds Industry in Trinidad and Tobago ($M)

Period	Money Market Funds	Equity Based Funds	Total Funds
2001	7,615.6	1,480.3	9,095.9
2002	12,092.2	2,063.4	14,155.5
2003	15,822.1	3,688.2	19,510.2
2004	18,334.7	5,628.1	23,962.8
2005Q1	18,754.8	6,661.8	25,416.6

Source: Central Bank if Trinidad and Tobago

The fact that money market funds dominate in terms of funds under management is in part due to the fact that they represent a closer substitute to bank deposits when compared to equity funds. That is, although they have higher returns than bank deposits they face relatively low risks of capital loss. The converse is true for equity funds. This dominance of the money market funds is changing, however, as the equity based fund is growing at a faster pace. Between the period December 2001 to March 2005 the equity based funds have grown at an annualized rate of 87.5% while money market funds have grown at an annualized rate of 36.6%. In terms of market share, equity funds have moved from 16.3% o the market in 2001 to 26.2% in 2005 while money market funds' market share have moved from 83.7% to 73.8% in the same period. The low interest rate environment since 2000 has helped to strengthen this trend. If the current trends persist this dominance of the money market funds in terms of market share may not hold.

The greater total returns generated by growth and income funds (equity based funds) together with their greater risk of capital loss, as well as the fact that funds under management in equity based funds is growing at a very fast rate requires that more attention be paid to the dynamics of this part of the mutual funds sector. In particular, greater attention needs to be paid to the *risk-adjusted* return performance of these funds.

4.0 EMPIRICAL ANALYSIS

4.1 Data and Descriptive Statistics

The data used in the study comprise daily data for three growth and income mutual funds in Trinidad and Tobago covering the period June 1, 2001 to June 8, 2005. The daily net asset value (NAV) of these funds was used to derive their daily return[5] using $NAV_t - NAV_{t-1}/NAV_{t-1}$. The risk free rate was proxied by the weighted average treasury bill rate and the rate of return on the risk free asset was calculated similarly to the that of the fund return. The excess fund return was simply the fund return minus the return on the risk free rate. The Composite Index[6] of the Trinidad and Tobago Stock Exchange was used as the benchmark index since this is a broader

[5] The return was calculated assuming that all dividends are reinvested and that fund expenses are deducted from the NAV.

[6] The All Trinidad and Tobago Stock Index was also available but was not used in the study because the growth and income funds typically have an asset portfolio comprised mostly of Trinidad and Tobago Stocks but include stocks from the rest of the region. This Index would therefore be less appropriate as a benchmark.

index that includes non-Trinidad and Tobago cross-listed stocks and the fund under study all have assets from across the Region.

Table 2 presents descriptive statistics for the variables used in the regressions. The results of the unit root tests indicate that all variables used in the regressions are stationary at levels. The descriptive statistics also show that the variables display many of the idiosyncratic features of financial time series such as skewness and volatility clustering. The Jaque-Bera statistic and its probability have also been calculated for each fund and the benchmark. This statistic indicates that the distribution of all fund returns, as well as that of the market index is approximately normal. This is important because Dybvig (1985) and Grinblatt and Titman 1989) have shown that Jensen measure is biased if the fund and benchmark returns are non-normal.

The data shows that the market index outperformed the 3 funds on a total return basis but of course the table also shows that higher returns were also associated with higher standard deviations which imply that on a risk adjusted basis this may not be so. It also highlights the importance of risk adjusted performance measures, especially for active investors. This observation is vindicated by the Sharpe ratios calculated in Table 3. These ratios indicate that fund 2 has the highest risk adjusted performance whereas the comparison of the simple total returns indicates that Fund 2 had the lowest return. Indeed, the statistics further show that only Fund 1 would have under-performed the benchmark based on the Sharpe ratio. If one was to make decisions based on the simple comparisons of total returns two mistakes would have been made. Firstly, we would have concluded that Fund 1 was the best alternative among the funds and; secondly, we would have concluded that it was better to invest in a passive benchmark portfolio. These mistakes would have obvious implications for the market share of the funds and the choice between an actively managed fund and a passive benchmark fund.

Table 2
Descriptive Statistics for Growth and Income Funds in Trinidad and Tobago

Variables	Descriptive Statistics				
	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
ROR Risk Free Rate	-0.44	9.59	-3.25	72.14	199540.2 (0.00)
ROR Fund 1	3.61	23.05	-0.99	161.54	1040089.0 (0.00)
ROR Fund 2	0.12	0.58	0.84	27.44	24828.4 (0.00)
ROR Fund 3	0.76	4.64	-3.09	54.10	1096547 (0.00)
ROR Market Index	76.75	261.57	4.86	52.02	103318.5 (0.00)
EROR Fund 1	4.05	24.14	-0.89	134.45	715061.8 (0.00)
EROR Fund 2	0.55	9.61	3.23	71.73	197205.3 (0.00)
EROR Fund 3	1.20	10.47	2.34	56.86	120940.6 (0.00)
EROR Market Index	77.19	261.79	4.84	51.82	102496.4 (0.00)

Source: The investment managers of the 3 growth and income funds.
Notes: 1. Sample size is 994.
2. ROR=Rate of Return
3. EROR=Excess Rate of Return

Table 3
Mutual Funds and Benchmark Sharpe Ratios

Portfolio	**Statistics**		
	Mean Excess Return	**Portfolio Standard Deviation**	**Sharpe Ratio**
Fund 1	4.0503	23.0543	0.1757
Fund 2	0.5533	0.5837	0.9479
Fund 3	1.1953	4.6393	0.2576
Market	77.1873	261.5728	0.2951

Source: Author's calculation.

4.2 Empirical Model

In this section we estimate the Jensen measure using the following single index model.

10. $$R_{pt} - R_{ft} = \alpha + \beta\left(R_{mt} - R_{ft}\right) + e_t$$

We also estimate a single index model using equation 11, which includes an enhancement to capture the impact of market timing based on the Treynor and Mazuy (1966) approach.

11. $$R_{pt} - R_{ft} = \alpha + \beta\left(R_{mt} - R_{ft}\right) + \delta\left(R_{mt} - R_{ft}\right)^2 + e_t$$

R_{pt}, R_{ft} and R_{mt} are the returns on day t of the fund, the risk free rate return and the benchmark return respectively. α and β are the Jensen alpha and a measure of the systematic risk of funds while e_t is a white noise error term. Both equations are estimated by OLS but we use Newey-West corrected standard errors to account for potential serial correlation and heteroscedasticity. The results of the estimations are presented in Tables 4and 5.

Table 4
Estimated Coefficients for model 10

Portfolio	Coefficients	
	α	β
Fund 1	3.66* (4.52)	0.005° (1.70)
Fund 2	0.35 (1.13)	0.003* (2.58)
Fund 3	1.04* (3.05)	0.002° (1.90)

Notes: 1. Figures in parentheses are t statistics
2. * Significant at 1% level
3. + Significant at 5% level
4. ° Significant at 10% level

The results of Table 4 indicate that fund 1 was the best performer followed by fund 3 with Fund 2 last. This virtually mirrors the ranking on the basis of total returns. The alpha of Fund 2 is also not significantly different from zero, which implies that this fund did not have differential returns in excess of the benchmark. The beta coefficients are small and positive, however, the beta of fund 1 and 3 are significant only at the 10% level. The betas of the funds are also relatively similar indicating that they fall in similarly conservative risk class. The small beta values may be indicative, however, that the funds' returns do not vary closely enough with the market returns, a situation which brings into question the suitability of the benchmark. The results from this simple model can also be distorted by market timing activities. We therefore use the Treynor and Mazuy (1966) approach to correct for market timing ability on the part of fund managers.

When we account for the potential of market timing in Table 5 the results are broadly similar to Table 4. Fund 1 and 3 have significant alphas but the alpha of Fund 2 although positive is not statistical significant. The betas of all the funds are also similarly small and positive. Interestingly, the coefficient of the timing variable is significant but very small and negative. This indicates that these funds do not time the market and if they do they have negative timing, that is, they increase their holding of the market portfolio in bear markets. The coefficient are so small, however, we can reasonably conclude that the funds do not time the market.

Table 5
Estimated Coefficients for Model 11

Portfolio	Coefficients		
	α	β	δ
Fund 1	3.57* (4.40)	0.009* (2.65)	-2.54(E-06)+ (-2.41)
Fund 2	0.29 (0.96)	0.005* (2.70)	-1.49(E-06)+ (-2.26)
Fund 3	0.99* (2.90)	0.004+ (2.26)	-1.43(E-06)+ (-2.09)

Notes: 1. Figures in parentheses are t statistics
2. * Significant at 1% level
3. + Significant at 5% level
4. ° Significant at 10% level

The most significant result, however, is the variability in ranking produced by the risk adjusted performance measures. The ranking produced by the Sharpe ratio is very different from that produced by the Jensen alpha. The results in Tables 4 and 5 point to one possible reason for this situation. The betas though positive are all small in absolute value indicating that the returns of the various funds do not vary closely enough with the benchmark returns, signaling perhaps that the benchmark used was inappropriate. The reliability of the Jensen approach depends on the suitability of the benchmark chosen. In particular, this performance measure depends on the benchmarks ability to mimic the fund style (Kothari and Warner 2001). In Trinidad and Tobago, the only benchmarks easily available are the All Trinidad and Tobago Index and the Composite Index. These indices can serve as benchmarks since a substantial part of the asset portfolio of these funds are invested in stocks on these markets. The growth and income funds being studied do, however, invest substantially in fixed income securities in Trinidad and Tobago, throughout the Region and Internationally, which do not form part of these benchmarks.

5.0 CONCLUSIONS

There are many interesting conclusions that can be inferred from the empirical analysis. Firstly, using performance measures such as total returns that are not adjusted for risks can be misleading to investors. One must have an idea of the risks of funds to make meaningful comparisons. In the case of growth and income funds this is even more important because the NAV in these funds tends to be more volatile. Returns can be exceptionally high in one quarter and fall of drastically in the following quarter, the risk- adjusted measures therefore gives the investor an appreciation of the probability of his investment making a net gain or loss.

The desirability of risk adjusted performance measures is, however, sometimes overshadowed by the difficulties involved in risk-adjusted measures. The information needed to execute may be prohibitive in some cases. The investors need to get information not only on returns but also on the asset allocation and investment strategy (passive or active managers) of funds. Very importantly, suitable benchmarks need to be developed for each fund style since the benchmark returns must mimic the fund returns to be effective. In many cases, specific benchmarks need to be developed and increasingly global investment banks and financial data providers are developing their own special purpose benchmarks. Developmental work is therefore needed to create new benchmark indices in the Region. Until we get to the stage in the region where the asset allocation of funds are transparent and there are appropriate benchmarks for all fund types simple ratios like the Sharp ratio together with the total returns may have to suffice for mutual fund performance evaluation.

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