

Firm characteristics and investment strategies in Africa: The case of South Africa *

Dana Achour

Merrill Lynch Global Asset Management Ltd.,
London, EC2Y 9HA UK

Campbell R. Harvey

Fuqua School of Business, Duke University,
Durham, NC 27708 USA
National Bureau of Economic Research,
Cambridge, MA 02138 USA

Greg Hopkins,

Merrill Lynch Global Asset Management Ltd.,
London, EC2Y 9HA UK

and

Clive Lang

Merrill Lynch Global Asset Management Ltd.,
London, EC2Y 9HA UK

ABSTRACT

We examine the viability of quantitative techniques for investing in individual stocks in the South African market. We measure the information in various firm specific attributes in forming portfolio strategies designed to outperform standard benchmarks. This market is particularly challenging given the extremely short sample by which we can calibrate our methods. Nevertheless, our out-of-sample analysis suggests that we can achieve up to 9% out-performance of standard benchmarks with our buy portfolio. Further, the difference between our recommended stocks and those we suggest avoiding is over 24% per year.

* This research was jointly conducted at Duke University and at Merrill Lynch. We would like to thank Martin O'Hare and Caroline Godden at Merrill Lynch Global Asset Management Ltd. for their valuable input. Statements in this publication do not reflect the views currently or previously held by Merrill Lynch Global Asset Management Limited (MLGAM) and are not necessarily reflective of the strategy employed by MLGAM or other parts of the Merrill Lynch Group. This publication is intended solely to demonstrate the results of research conducted at MLGAM and does not constitute investment advice. Any information contained herein is not warranted by MLGAM to be accurate.

1. Introduction

A quantitative framework for executing bottom up strategies in emerging markets was detailed in Achour, Harvey, Hopkins and Lang (1998).¹ This paper conducts in-depth market by market analysis and evaluates the ability to select stocks in both bull and bear markets.

South Africa is a particularly challenging market. The sample that we have to work with is very short giving us little time to calibrate the parameters of our model. South Africa is also a country that experienced significant structural shifts: both economic and political. While there is a large degree of country risk, there are also substantial potential gains for investors in this emerging market. Indeed, most of the last frontier markets reside in Africa and South Africa is a good starting point for developing selection strategies for other national markets in Africa.

We follow closely the framework detailed in Achour et al. (1998). We combine historical data from the International Finance Corporation (IFC), Morgan Stanley Capital International (MSCI), Worldscope and IBES. We examine a number of standard attributes like book value to price, cash flow to price, earnings to price, dividends to price, earnings growth, revenue growth, debt/equity ratios, return on equity and market capitalization. In addition to these essentially historical measures, we examine prospective earnings to price ratios measured over different horizons, IBES revisions, prospective earnings growth as well as a number of momentum measures.

Our results suggest that significant value can be added by our stock selection mechanisms. Our out-of-sample results show that our buy list significantly outperforms the standard benchmarks. The margin is large enough to succumb the transactions costs in these markets.

Given that details of the framework are presented in Achour et al. (1998), we focus on the detailed factor by factor results in this paper. However, in the interest of being self-complete, we repeat many of the factor definitions and methodological details.

2. Asset selection process

2.1 Screening methodology

At the start of each holding period, firms are sorted on the observable characteristics defined below and assigned in equal numbers to a pre-defined number of portfolios (fractiles) on the basis of its rank. For example, if all available stocks for a given

¹ An early treatment of the cross-sectional determinants of emerging market returns is contained in Bekaert, Erb, Harvey and Viskanta (1997) who detail the impact of a number of factors on country indices. Individual stock selection is the focus of Claessens, Dasgupta and Glen (1998) as well as Achour et al. (1998) and Rouwenhorst (1998).

characteristic are ranked in order of expected return, then top one third become the top “fractile” and the bottom (lowest scoring) third become the bottom “fractile”. If there is a tie around the portfolio breakpoints, stocks are assigned to lower portfolios. The number of fractiles that we choose depends on the number of securities available. With fewer securities, we focus on three fractiles. In countries with more securities, we use five fractiles. We calculate both equal and value weighted returns for each portfolio. For this paper, we focus most of our attention the top and bottom portfolio performance. Stocks for which no ranking information exists are excluded to an ‘NA’ category or not ranked portfolio and analyzed separately.

Our paper focuses on what we have termed ‘univariate’ sorts, i.e. portfolio formation based on a single attribute. However, for many attributes we did examine ‘bivariate’ sorts simultaneously based on two criteria. Given space constraints, it is not possible to report the results of bivariate sorts.

Our method involves performance screening in an ‘in-sample’ period that ends in December 1995. We then assign weights to each characteristic and develop a final selected portfolio. We call this the “scoring screen”. This scoring screen is then tested in the hold-out period (which we refer to as ‘out-of-sample’ period) from 1996 through March 1998. Our exhibits show performance statistics through March 1998, i.e. both in sample and the hold-out sample. However, we combine these periods only for the purposes of presentation in this paper. In our research, the in-sample and out-of-sample periods were separated. Further, the reader can see the year-by-year performance in the in-sample and out-of-sample periods. Top-bottom spread returns are reported as well as calculated premia over a selected investment benchmark.

Returns are calculated after adjusting for splits, dividends and rights offerings and denominated in US dollars using exchange rates supplied in the IFC’s Emerging Market Database (EMDB). Value weighted portfolio returns are constructed using relevant IFC adjustment factors to replicate the index level returns on a bottom up calculation. These adjustment factors are made for corporate actions and for government and cross ownership (from November 1996). Firms with more than one share class, which IFC have included to achieve the desired index level weighting structure, are aggregated together to form a single basket of outstanding shares in our screens. Where different classes of shares are priced differently, the fundamental data used in the analysis is linked to the most liquid class of shares available to international investors. The market capitalization has been adjusted to take all classes of shares together. Exhibit 1 presents the value of US\$100 invested in the South African market in January 1993 through March 1999.

2.2 Diagnostics

A battery of diagnostic criteria is presented to assist the evaluation of each screening factor. Each diagnostic is carefully defined in our performance report template that is presented in Exhibit 2.

EXHIBIT 2

Performance diagnostics:

Note :	Performance Measure/Summary Statistic	Definition ²
1	Annualized average return ³	<i>Stock level</i> - Annualized geometric average of post-rank portfolio US Dollar total returns over all observation periods. Total return is calculated by adding the last 12 months gross cash dividend at ex-dividend date, adjusted for the length of the return period, to the closing monthly USD market price. Returns are value weighted by the market capitalization as at observation date. <i>Index level</i> - Similarly for the market portfolio, though the index return levels will be as sourced from database providers using the value weighted index returns ⁴ .
2	Cumulative return (indexed at 100 - start)	Value of \$100 if invested at the first observation date and compounded over intervening periods.
3	Std Deviation of returns	Annualized standard deviation of post-rank portfolio returns over all observation periods.
4	Average annual excess return - Rm.	Annualized geometric average of post-rank portfolio excess returns above the market portfolio over all observation periods.
5	Average annual excess return - Rf	Annualized geometric average of post-rank portfolio excess returns above annualized US 90 Day T-bill rate over all observation periods.
6	Std Deviation of excess rtns - Rm	Annualized standard deviation of post-rank portfolio excess returns above market portfolio over all observation periods.
7	Std Deviation of excess rtns - Rf	Annualized standard deviation of post-rank portfolio excess returns above annualized US 90 Day T-bill rate (as at observation date) over all observation periods.
8	T-stat	Test of whether average excess return is significantly different from zero.
9	Systematic risk (Beta)	Slope of regression line estimated by regressing average post-rank portfolio returns on the relevant market portfolio return over all observation periods. No lags are incorporated in the market portfolio return to allow for non-synchronous trading.
10	Alpha	Annualized intercept of the regression line estimation per Systematic risk (Beta) above.
11	Co-efficient of determination	Co-efficient of determination (R-Square) of average post-rank portfolio returns versus the market portfolio return over all observation periods.
12	Average market cap	Sum of all constituent market capitalizations in local currency divided by the total number of portfolio constituents over all

² Definition applicable to equal and value weighted fractiles and benchmark performance measures.

³ See body of text on return calculations

⁴ Although value weighted index returns will obviously impart a known size bias (that will vary from market to market depending on the distribution of size) on the comparative benchmark returns this is unavoidable due to non-availability of an equal weighted benchmark in many markets.

13	% periods > market portfolio	observation periods. Percentage of total observations that average post-rank portfolio return was greater than the market portfolio return over the holding period.
14	% periods > Bench up Mkt	Percentage of total observations that average post-rank portfolio return was greater than the market portfolio return when the market portfolio return was greater than zero.
15	% periods > Bench Dn Mkt	Percentage of total observations that average post-rank portfolio return was greater than the market portfolio return when the market portfolio return was less than zero.
16	Max # of consecutive bmark out-performance	Longest string of consecutive observations where average post-rank portfolio return was greater than the market portfolio return.
17	Maximum positive excess return	Highest single post-rank portfolio excess positive return above market portfolio over all observation periods.
18	Maximum negative excess return	Lowest single post-rank portfolio excess negative return above market portfolio over all observation periods.
19	% periods positive returns to negative	Ratio of portfolio post-rank average returns greater than zero to post-rank returns less than zero over all observation periods.
20	% periods of negative returns	Percentage of observations that portfolio post-rank returns were less than zero over all observation periods, indicative of the historical probability of losing money.
21	Max # of consecutive negative periods	Longest string of consecutive observations where average post-rank portfolio return was less than zero.
22	Max # of consecutive positive periods	Longest string of consecutive observations where average post-rank portfolio return was greater than zero.
23	Cumulative annual returns	Value of \$100 if invested on the 1 st January of each year of the observation period and compounded over intervening observation to 31 st December. Cumulative returns for 1998 would represent a year to last observation date return.
24	Relative Performance	Average relative performance of portfolio generated on simple scoring algorithm that assigns a weight to the portfolio in each year of the observation period based on its cumulative annual return performance rank relative to its peers. Therefore, the minimum score a portfolio could obtain would be 1, maximum r and average $(n + (n+1) + (n+2) + \dots + (n+r))/r$ where n is the number of years in the observation period and r is the number of portfolios.
25	Cumulative annual returns - last 2 and 5 years	Value of \$100 if invested two or five years preceding the most recent observation and compounded over intervening periods.
26	Factor average	Arithmetic average of constituent ranking factors over all observation periods.
27	Factor median	Median value of constituent ranking factor over all observation periods.
28	Factor standard deviation	Standard deviation of constituent ranking factors over all observation periods.

In addition to the diagnostics, we assign a premium to consistency. Quantitative measures such as the longest strings of negative and positive absolute and relative returns, performances in up and down markets and the historical probabilities of losing money add further dimensions to traditional statistical risk and expected return measures. These

measures are further complemented by the simple relative performance scoring algorithm diagnostic which assigns a weight to the portfolio in each year of the observation period based on its cumulative annual return performance rank relative to its peers. Average scores across the observed periods will deliver information regarding performance consistency.

One notable absence from the table is the analysis of transaction costs. In measuring the performance of portfolios, we adopted rudimentary assumptions for turnover costs because of the well documented difficulties on capturing costs associated with different instruments traded, bid-ask spreads, market impact and opportunity costs on execution time durations. To address the issue of the effects of implementing a trading strategy, our models are run with longer holding periods to check for robustness and to identify factors with return premia which persist on longer holding periods.

2.3 Factor selection

There are many elements that enter our algorithm for factor selection. Given the number of factor screening candidates, we need to greatly reduce the dimensionality (isolate a small number of factors) for our final portfolio selection, which we will call the final scoring screen. The factor report cards detailed in Exhibit 2 yield 28 different diagnostic pieces of information. It is also important to understand the interrelationships between the various factors. This must be supplemented by correlation analysis to eliminate potentially redundant screening factors.

We calculate (but do not report) correlations between the portfolio returns derived from each factor screen. We do this separately for the top fractile and the bottom fractile portfolio. For this analysis, we used value-weighted portfolios. As we assign weights to both top and bottom factor portfolios in arriving at a composite factor score for firms in the universe we present matrix correlation coefficients for both. Factor returns that are highly correlated in the top portfolio may exhibit weak or negative correlations in the bottom. Some of the variation may be attributed to the collection of heterogeneous groups of stocks in certain bottom portfolios due to the nature of the sort - lumping high earnings multiple and loss making firms together in an earnings yield sort, for example. This is illustrated by the high correlation coefficients obtained in top portfolios between earnings yield and book to price ratios in South Africa (0.82) and the lower observed values in the bottom portfolio (0.69).

We find high correlations among value strategies, which is due in part to price appearing in the denominator of these ratios. Unlike value screens, correlations and factor performances among growth proxies differ visibly. Estimate revision screens (change in consensus FY1 estimates and consensus forecast earnings estimate revision ratio) have higher relative correlation coefficients with growth proxies as these type of screens generally behave better in growth oriented environments where premiums are paid for additional amounts of nominal earnings.⁵

⁵ See, for instance, Bernstein (1995).

2.4 Final portfolio selection and diagnostics

Our final portfolio selection is based on a combination of:

1. Assessment of the factor based on the 27 diagnostics presented in Exhibit 2
2. Bivariate screens that combine information in two factors (not reported)
3. Correlation analysis
4. Success ratios
5. Quadratic optimization (not reported)
6. Quantitative adjustments for high transaction costs inducing factors (not reported)
7. A final “knock-out” list.

Steps one through six are what we characterize as the “scoring screen”. This screen uses information in both the top and bottom performing fractiles. That is, our buy list is not a simple combination of the top fractiles. While it might not be possible to short stocks in the bottom fractiles, membership in this fractile is useful in penalization of a particular security or for its removal from a buy list through time.

The seventh step, the “knock out” criteria, eliminates firms that are too small for meaningful portfolio investment. It also isolates firms that have unreasonable leverage. It should be emphasized that the inputs for the scoring screen includes information, such as bivariate sorting and some additional univariate screens, which have not been included in this text.

The success ratio analysis is another diagnostic measure that gives insight into performance differentials. The success rate measures the percentage of stocks in the top portfolio that outperform the benchmark market portfolio at a particular observation and the percentage that underperform in the bottom portfolio. The average of these rates through time will reveal the depth of portfolio performance and the proportion of firms driving performance. We examine this measure for each of the screening factors. The definitions for this analysis are contained in Exhibit 3.

EXHIBIT 3 Success Rate definitions

Performance factor	Definition
Success rate	Calculated individually for both top and bottom portfolios as the percentage of stocks in the top portfolio at a particular observation that <i>outperform</i> the Market portfolio, and the percentage of stocks that <i>underperform</i> in the bottom portfolio. For example, if 10 stocks are sorted into a top factor portfolio and eight of those stocks have returns <i>greater</i> than the market then the success ratio is 80%. In the same strategy at the same observation date, if six of the 10 stocks collected in the bottom portfolio have returns <i>less</i> than the market the success ratio for that bottom portfolio would be 60%.

Average success rate	Arithmetic average of the observed success rates over all observations.
Standard deviation of average success rate	Standard deviation of the observed success rates from the average success rate over all observations.
Average success rate consistency ratio	Percentage of observations that the success rate was greater than 50%.
Success rate - Most successful	Highest observed single success rate over all observations.
Success rate - Least successful	Lowest observed single success rate over all observations.
Universe	Those constituents of the selected index (market portfolio) for which relevant ranking information exists at a particular observation date.

The success ratio analysis is a particularly useful tool in helping us assess the probabilities of type I error (incorrectly classifying a winner to the bottom fractile) and type II error (incorrectly assigning a loser to the top fractile). Indeed, no matter how favorable a screen might look, there is still a chance that losers will be assigned to a buy list. However, if one is able to do independent fundamental research on the individual firms, it may be possible to more accurately identify winners in the top fractile. Of course, our final portfolio is evaluated using a number of criteria, only one of which is the success ratio.

3. Data

3.1 Primary sources

Our data are drawn from a number of sources all contained within the FACTSET database system. We use constituent data from the International Finance Corporation (IFC), Worldscope and the Institutional Brokers Estimate System (I/B/E/S). In some of our analysis, we also use data from Morgan Stanley Capital International (MSCI). Our analysis uses returns and data on 21 firm characteristics.

The universe of stocks for all markets as well as benchmark returns are sourced from the IFC Global indices through time. The IFC is widely regarded as having the most complete emerging market data set and has been widely used in recent academic studies, for example Harvey (1995) and Rouwenhorst (1999). The IFC's Emerging Market Database (EMBD) generally has the longest histories and highest quality data sets for emerging markets. The selection of IFC facilitates the back testing of the chosen factors. It also has the advantage of being a 'snap shot' database which eliminates most survivorship biases. That is, for our sample, no data has been backfilled by the IFC.

As the principal focus of the paper is on the predictive power of local factors through time and not on the impact of investment restrictions, we have used the broader global indices that do not include adjustments made for investability. Hence, we focus on the IFC 'Global' indices rather than the IFC 'Investible' indices. The 'investible' stocks are those that are available to foreign institutional investors and which pass screens for minimum size and liquidity.

3.2 Screening factors

We classify our screening factors into three groups: historical accounting characteristics (fundamental factors); expectations (expectation factors); past returns (technical factors) and size (size factors). Fundamental, technical and size factors are from IFC where available or from Worldscope, while the expectation factors are from I/B/E/S. Each of our screening factors is detailed in Exhibit 4.

EXHIBIT 4
Details of Screening Factors

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p>1 Market capitalization</p> <p>Small cap effect persists through time.</p> <p><i>Top portfolio : Small capitalization stocks</i></p> <p><i>Bottom portfolio : Large capitalization stocks</i></p> <p>Code⁷ : CAP</p>	IFC	<p>Number of shares outstanding for index purposes * closing monthly market price</p> <p>Note 1 : Number of shares outstanding as at the balance sheet date, adjusted for corporate actions and reduced by government and cross ownership (from November 1996) per capital adjustment factor. For firms with more than one share class, we have used whenever possible the aggregate Worldscope weights for that firm. Where the Worldscope weights are missing, we used the constituent IFC weights. Therefore, the weighting in the benchmark that we use, the IFC index, could differ from the weighting that we use in our value-weighted portfolios.</p> <p>Note 2 : Market price as at date of observation in local currency (consistent across all factors).</p>	<ul style="list-style-type: none"> • Diagnostic screen to investigate performance differential between large and small capitalization stocks. [Certain screens in the study were not considered for incorporation into the selection model but were constructed to give insight into the behavior of specific market segments through time]. • Size is widely regarded as a proxy for trading liquidity. • Small capitalization stocks tend to have higher transaction costs. [There are well documented difficulties on capturing costs associated with different instruments traded, bid ask spreads, market impact and opportunity costs on execution time durations] • Risk, as defined by volatility of historical returns, tends to increase as size decreases.⁸ • If there is no risk premium associated with investing in smaller capitalization stocks, then investors are expected to migrate toward larger capitalization stocks which have lower perceived risks. • IFC selects constituents for their indices based on liquidity, track record, institutional interest, and industry representation, that is, their selection is not random. Track record may preclude the selection of small capitalization emerging growth stocks, therefore small capitalization

⁶ For all screening factors, stocks for which relevant ranking information does not exist are classified into a not ranked fractile and monitored separately.

⁷ Short form screen code for selected tables and text

⁸ See Bernstein (1995) for a general discussion on the behavior of market capitalization and size effects.

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p>2 Change in Return on Equity</p> <p>Stocks with improving returns on equity and thus ‘quality’ should outperform through time</p> <p><i>Top portfolio : High change</i></p> <p><i>Bottom portfolio : Low change</i></p> <p>Code : CH_ROE</p>	IFC	Return on equity (current year) –Return on equity (previous year)	<p>stocks may show significant value characteristics [Emerging ‘growth’ stocks probably enter universe as more mature mid caps].</p> <ul style="list-style-type: none"> • Smaller stocks tend to be regarded as lower ‘quality’ stocks [Smaller stocks due to the inherent variability in earnings and exposures to the local economy are generally regarded as being of lower ‘quality’]. • Small stock effects may pervade the results of other factors described below. To this end, we examine the impact of size on all the factors below. We construct bivariate screens to test whether a candidate factor discriminates between high and low expected return stocks across all size categories. <ul style="list-style-type: none"> • To capture changes in the levels of a company’s return on common equity, as compared with a more traditional ‘quality’ rank. • Our objective is to identify companies that investors believe are higher ‘quality’ before subsequent shifts in valuation multiples occur. For example, a company that improves its return on equity from 10% to 15% might be very attractive although this stock might not necessarily be ranked in the top portfolio of a simple return on equity sort. • This screening factor might be improved by combining it with IBES expectation data and a bivariate sort.
<p>3 Debt to common equity ratio</p>	Worldscope	(Total debt/common equity)*100	<ul style="list-style-type: none"> • Diagnostic screen constructed to give insight into

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p>Highly leveraged stocks expected to out-perform to compensate for the higher implied risks.</p> <p><i>Top portfolio :</i> <i>High debt to equity</i></p> <p><i>Bottom portfolio :</i> <i>Low debt to equity</i></p> <p>Code : DE</p>		<p>(Long term debt + Short Term Debt + Current Portion of Long Term Debt)/ Common Equity *100</p>	<p>performance differential between leveraged and un-leveraged stocks. [Not considered for incorporation into the selection model].</p> <ul style="list-style-type: none"> • Debt/equity ratios can be used as a proxy for ‘quality’ and perceived risk⁹ and screens on ‘good’ and ‘bad’ companies. Formed portfolio returns expected to have a high correlation with certain value return screens [see earnings yield below, for example]. • Data assimilated from most recent fiscal year end. • Lag incorporated on assimilation of data to ensure data item is available for out-of-sample portfolio formations. • Rank comparisons across some constituent sectors are difficult. This is the case in the banking sector, for example, since taking deposits is analogous to borrowing, and we exclude this sector from the screen for this reason.
<p>4 Dividend yield</p> <p>Higher yielding stocks should exhibit superior performance through time.</p> <p><i>Top portfolio :</i> <i>High dividend yield</i></p> <p><i>Bottom portfolio :</i> <i>Low dividend yield</i></p> <p>Code : DY</p>	IFC	<p>Last 12 months cash dividends / closing monthly market price)*100</p> <p>Note: On a per share basis at ex-dividend date, using gross cash dividends. Adjustment made by database provider to ensure all shares issued and outstanding for index purposes receive same dividend</p>	<ul style="list-style-type: none"> • High correlation with other ‘value’ factors as these tend to be shorter duration strategies. [Duration refers to interest rate sensitivity and is defined by the relative change in an instruments return to a defined change in the level of interest rates]. • Smaller capitalization stocks tend to have higher yields. • All dividends expressed in local currency terms

⁹ Screen can be used to corroborate use of factor as part of a set of knockout criteria to control final model risk.

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p>5 One year historical earnings growth/momentum</p> <p>high earnings momentum stocks should outperform through time.</p> <p><i>Top portfolio : High earnings momentum</i></p> <p><i>Bottom portfolio : Low earnings momentum</i></p> <p>Code : HEGR_1Y</p>	IFC	<p>(Last 12 months trailing earnings per share- previous last 12 months trailing earnings per share) /(absolute previous last 12 months trailing earnings per share))*100</p> <p>Note 1: In hyperinflationary economies IFC uses adjusted earnings and book values, inflating trailing earnings and historical book values by intervening period inflation. Consistent across all factors with earnings and book value per share in formulas. Reported as opposed to operating earnings have been used throughout the study due partly to the availability and quality of the reported data but also to capture the effect of any asset write-offs that may occur during periods of falling inflation.</p> <p>Note 2 : The use of absolute numbers in the rate of change calculation permits the capture of any turn around effect in earnings, though stocks reducing losses will be perceived as being short term (expected) momentum companies. The relative performance of this group, though, may be investigated by repeating the analysis and excluding this group.</p>	<ul style="list-style-type: none"> • Earnings momentum indicator frequently used as the best growth proxy due to information deficiencies in certain emerging markets. • Assumes that analysing the past has value for subsequent forecasts. • Useful indicator to identify those stocks with rising expectations among investors prior to their establishing a track record. • We conducted the analysis excluding negative historical previous earnings for comparison purposes. • Can be screened with estimate revision ratios [see Consensus forecast earnings estimate revision ratio below for definitions] to identify future earnings surprises and recovery situations. This directly introduces market expectations of earnings growth rather than relying on changes in historical earnings.
<p>6 Three year historical earnings growth rate</p>	IFC	<p>The rate of change in reported last twelve month earnings per share over the three year time interval terminating on the date</p>	<ul style="list-style-type: none"> • A traditional growth proxy highlighting a stock's historical track record and stability.

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p>Stock exhibiting best long term track records should continue to provide superior growth rates and return premiums</p> <p><i>Top portfolio : High earnings growth</i></p> <p><i>Bottom portfolio : Low earnings growth</i></p> <p>Code : HEGR_3Y</p>		<p>of the last interim period for which earnings were announced.</p> <p>Note : Annual growth rate is computed by fitting a least squares growth line to the logarithms of the reported or prospective (where applicable) earnings data over the specified period. The following rules hold for factor rank :</p> <p>Rates will only be generated if first and last time periods are greater than zero, Non-available or negative data in interim period is discarded.</p>	<ul style="list-style-type: none"> • Stocks which pass factor criteria have a visible track record, a perceived rarity in the volatile emerging markets and should therefore trade at high premiums even though it is generally accepted that naive extrapolations in these volatile markets are futile. • Does not incorporate the element of expectation but rather known growth, which is effective for identification of a 'quality' universe of stocks. • In order to include a larger number of stocks in the analysis, when less than three years of data were available, we included stocks that did include a full two-year data history.
<p>7 Earnings yield</p> <p>High yield 'value' companies should provide superior future returns through time.</p> <p><i>Top portfolio : High earnings yield</i></p> <p><i>Bottom portfolio : Low earnings yield</i></p> <p>Code : EY</p>	IFC	<p>(Last 12 months trailing earnings per share/closing market price)*100</p> <p>Per share data – Aggregate reported earnings divided by the total number of shares outstanding (all classes) as of the balance sheet date, adjusted for corporate actions and reduced by government and cross ownership (from Nov 96) per capital adjustment factor. This is consistent across all factors constructed using IFC per share data.</p>	<ul style="list-style-type: none"> • Traditional 'value' / 'growth' proxy used by investors. • Value stocks generally are riskier as they are usually firms under distress, have high financial leverages and face substantial uncertainty in future earnings. • Much has been written about the shortcomings of the incorporation of traditional measures such as earnings yield. One can argue that these measures may be influenced by accounting practices, may not incorporate risk or the time value of money and may be seen as a function of value and not a determinant of value. • On the other hand, for many common stocks, the average relation between price and reported may reflect the views of investors as to the quality and growth of the issue. It may give information about, inter alia, the quality of management, the firm's individual prospects, the

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p>8 a) Change in Consensus FY1 estimate - last 3 months</p> <p>b) Change in Consensus FY1 estimate - last 6 months</p> <p>Stocks with rising</p>	IBES estimates	<p>a) $((\text{Consensus forecast earnings per share Fiscal Year 1 (FY1) at date of observation} / \text{consensus forecast earnings per share FY1 3 months preceding date of observation}) - 1) * 100$</p> <p>b) $((\text{Consensus forecast earnings per share Fiscal Year 1 (FY1) at date of observation} / \text{consensus forecast earnings per share FY1 6 months preceding date of observation}) - 1) * 100$</p>	<p>competitive position, the stability and growth of past earnings and its financial strengths.</p> <ul style="list-style-type: none"> • Though there are benefits in using yield and value ratios, data quality and history often preclude their effective implementation. • The use of earnings yield as a factor can result in sorting on incorrectly identified ‘value’ companies. Anticipatory stock price movements could induce a migration into ‘value’ territory before the next round of reported financial information alters the multiple. Combining the historical factor (earnings yield) with an expectational factor [such as a revision ratio sort, for example] in a bi-variate sorting model could partially alleviate this problem [this will also apply to other ‘value’ screens below]. • Inverting traditional price to earnings ratio will result in the collection of loss making stocks in the bottom ranked portfolio. The relative performance of this group may be investigated by exclusion through time. • Without some form of relative attribution adjustment, sectoral influences could appear in ranks through time. <ul style="list-style-type: none"> • Factor indicates the magnitude of change in Fiscal Year 1 consensus forecast earnings estimates over the preceding 3 and 6 month period from observation date. • Good indicator to isolate companies with changing earnings expectations and those that have provided interim earnings surprises. [The screen’s design will discriminate between stocks with both rising and falling earnings expectations.] • Should have high correlation with growth proxies as revision screens generally behave better in growth oriented environments. • Generates insight into behavioral aspects of estimates

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p>earnings expectations should outperform through time.</p> <p><i>Top portfolio : High change in estimate</i></p> <p><i>Bottom portfolio : Low change in estimate</i></p> <p>Code : CH_FY1_3M</p>		<p>Note : Average EPS estimate known as consensus forecast is calculated by adding current EPS estimate data for the specified periods from all contributing IBES firms and dividing by the number of EPS estimates that enter into the calculation. A composite forecast of earnings per share that distills current EPS estimate data for the specified fiscal time period into a single expectation. Gains from combining security analysts forecasts arise from using more information in the aggregate than is used by any individual, and from the reduction of individual analysts' forecasts error through diversification.</p>	<p>revisions as estimation precision increases with approaching fiscal year end.</p> <ul style="list-style-type: none"> • Frequency of estimate revisions and magnitude of variation from mean estimates will increase in volatile macro environments. • Similar to the Consensus forecast earnings estimate revision ratio below but captures the magnitude of change in the revisions over the preceding period. • In some instances, IBES estimates are refer to a different class of share from the IFC constituent. In these cases, we have IBES data
<p>9 Consensus FY2 to FY1 estimate change</p> <p>Stocks with high changing medium term expectations should outperform through time.</p> <p><i>Top portfolio : High change in estimate</i></p> <p><i>Bottom portfolio : Low change in</i></p>	<p>IBES estimates</p>	<p>Consensus forecast earnings per share Fiscal Year 2 (FY2) / Consensus forecast earnings per share Fiscal Year 1 (FY1)-1)*100</p> <p>Consensus forecasts at date of observation.</p>	<ul style="list-style-type: none"> • Change in estimate captures the rate of change in earnings per share that is expected for the company into Fiscal Year 2. • Identifies stocks with changing medium term earnings expectations.

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p><i>estimate</i></p> <p>Code : CH_FY2_FY1</p>			
<p>10 Consensus forecast earnings estimate revision ratio</p> <p>Stocks exhibiting high earnings revisions and rising expectations should out-perform through time.</p> <p><i>Top portfolio : High revision ratio</i></p> <p><i>Bottom portfolio : Low revision ratio</i></p> <p>Code : IREV_3M</p>	<p>IBES estimates</p>	<p>((Sum of trailing 3 months upward FY1 estimate revisions) - (Sum trailing 3 months downward FY1 estimate revisions)) / (Total trailing 3 months FY1 estimates)</p> <p>The ratio of the number of net upward or downward current EPS estimates for fiscal year one over the preceding three months to the total number of estimates made over the same period.</p>	<ul style="list-style-type: none"> • Good proxy for isolating pre-earnings momentum stocks and stocks with changing earnings expectations. • Similar to Change in Consensus FY1 estimate - 3 and 6 months factors above but may also measure the degree of sentiment. • Ratio also effective in isolating changing expectations of companies which suffer relative neglect by the investment research community. • The ranked universe can be split using a portfolio midpoint to isolate homogenous groups of upward, downward and zero revisions.
<p>11 Book to price ratio</p> <p>High book to price ratio stocks should out-perform through time.</p> <p><i>Top portfolio : High book to price</i></p>	<p>IFC</p>	<p>(Historical book value per share/closing monthly market price)*100</p> <p>Note : Historical book value per share - most recent annual book value as reported on balance sheet at the latest fiscal year end (with interim figures used if available). This will be adjusted between balance sheet report dates by the amount of</p>	<ul style="list-style-type: none"> • Traditional 'value'/'growth' proxy. • Conventional wisdom suggests that the book-to-price ratio is one of the most straightforward and effective investment factors in the emerging markets. • Developed market studies show high correlation between size and book value, though small capitalization stocks will tend to be small cap 'value' stocks with relatively high levels of distress. • Technically insolvent companies are included in bottom

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p><i>ratio</i></p> <p><i>Bottom portfolio :</i> <i>Low book to price ratio</i></p> <p>Code : BPR</p>		<p>capital raised by rights issues, and in the case of hyper inflationary economies, by intervening inflation adjustments.</p>	<p>portfolios with high premium stocks, though the relative performance of this group may be investigated by exclusion through time.</p> <ul style="list-style-type: none"> • Without some form of relative attribution adjustment sectoral influences could appear in ranks through time.
<p>12 Cash earnings to price yield</p> <p>High cash earnings to price yield stocks should outperform through time.</p> <p><i>Top portfolio :</i> <i>High cash earnings to price yield</i></p> <p><i>Bottom portfolio :</i> <i>Low cash earnings to price yield</i></p> <p>Code : CEY</p>	<p>IFC</p>	<p>(Cash earnings per share / closing market price)*100</p> <p>Note 1: Cash earnings per share -last 12 months trailing earnings per share plus depreciation as reported in the Cash Flow Statement divided by the total number of shares outstanding.</p>	<ul style="list-style-type: none"> • Traditional ‘value’ proxy which facilitates cross sectional comparisons by removing the effect of depreciation policies on earnings. • Not a true cash flow per share factor though should provide some information regarding a company's ability to leverage itself, to pay dividends and to enjoy financial flexibility. • Obvious shortcomings in availability and “quality” of data and noise inherent in reduced samples of firms [companies that do not report depreciation figures are excluded from the factor sort]. There is potential information in investigating stocks collected in bottom portfolio and premiums paid for higher quality cash earnings. • Inverting the traditional price-to-cash earnings ratio will result in the collection of deficit cash flow stocks in the bottom ranked portfolio, though the relative performance of this group may be investigated by exclusion through time.
<p>13 a) One month price momentum b) One year price momentum</p> <p>A firm’s past return</p>	<p>IFC</p>	<p>a) One month USD price change b) Last 52 week USD price change</p>	<ul style="list-style-type: none"> • Momentum or relative strength portfolios are formed by ranking stocks on past one and twelve month returns. • As shown in other research for developed markets, momentum returns accrue gradually over a period of up to one year after ranking. • Strategy has higher implied portfolio turnover.

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p>helps to predict future returns, and past momentum stocks should continue to outperform.</p> <p><i>Top portfolio : High momentum</i></p> <p><i>Bottom portfolio : Low momentum</i></p> <p>Code : PM_12M, PM_1M</p>			<ul style="list-style-type: none"> • Previous research has introduced a one month lag in portfolio formation after observation date to compensate for bid-ask bounce. We check the sensitivity of our results by excluding the first lagged month in the one-year momentum screen. • Collection of extreme rankings in outlier portfolios of one month momentum strategies may pre-empt a degree of reversal. • Momentum effects more evident with longer horizon (52 week) price changes.
<p>14 12 months prospective earnings growth rate</p> <p>Stocks with highest expected short to medium term growth rates should outperform through time.</p> <p><i>Top portfolio : High prospective growth</i></p>	<p>IBES Estimates</p>	<p>((Rolling 12 month consensus forecast earnings per share - historical trailing earnings per share) / absolute¹⁴(historical trailing earnings per share))*100</p> <p>The rate of change in earnings per share that is expected for the stock over the specified period, expressed as a percentage.</p> <p>Note 1: Rolling 12 month forward IBES estimates calculated as follows :</p> $((M1 * F1) + ((12 - M1) * F2)) / 12$ <p>Where :</p>	<ul style="list-style-type: none"> • Traditional short to medium term growth proxy that discriminates on differential earnings expectations. • Trends over short term period may be dominated by the business cycle, or in some cases the industry cycle. • The use of rolling 12-month forward estimates reduces the inherent redundancy that accrues as fiscal year end is approached. • Stocks with the highest expected earnings could have the greatest propensity to disappoint or torpedo, as surprises are more likely on the down side. • When the IBES database had missing financial ratios, we elected to use the IFC data to fill in the missing data.

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p><i>Bottom portfolio : Low prospective growth</i></p> <p>Code : PEGR_1Y</p>		<p>M1 = number of month ends to end of current fiscal year. Note that the current fiscal year will be FY1 if the date is before the FY1 year end, and FY2 if the date is after year end</p> <p>F1 = Consensus EPS forecast for current fiscal year</p> <p>F2 = Consensus EPS forecast for next fiscal year</p> <p>Rolling 24 month data will be constructed on the same principle as above but will access FY3 estimates to preserve the two year forward window.</p> <p>Note 2 : See factor 5 for explanation on use of absolute numbers</p>	
<p>15 Three year prospective earnings growth rate</p> <p>Stocks with highest expected medium to longer term growth rates should outperform through time.</p>	<p>IBES Estimates</p>	<p>The expected rate of change in Consensus forecast earnings per share over a three year time horizon.</p> <p>A composite forecast of the anticipated annual growth rate in earnings per share over the longer term.</p> <p>Note 1 : See factor 6 for definitions of rate function</p> <p>Note 2: Due to the fact that certain markets</p>	<ul style="list-style-type: none"> • Growth rate provides a more robust view of a stock’s longer term earnings expectations. • Longer forecasts are often used to justify the high multipliers of earnings some-times commanded by growth stocks. • Provides insight into extrapolation of past growth trends. • Higher premia paid for ‘growth’ stocks built on the rationale that a dollar of retained earnings in a firm with greater opportunities to invest at higher rates, has a higher perceived investment value. • Three years forward is the maximum available time

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p><i>Top portfolio :</i> <i>High prospective growth</i></p> <p><i>Bottom portfolio :</i> <i>Low prospective growth</i></p> <p>Code : PEGR_3Y</p>		<p>have infrequent fiscal year three estimates, the best expectation of longer term growth in those markets will be constructed using FY2 data.</p>	<p>window, longer forecasts incrementally lose value in volatile markets.</p>
<p>16 a) 12 month prospective earnings yield b) 24 month prospective earnings yield</p> <p>Stocks with the greatest perceived expected 'value' should outperform through time.</p> <p><i>Top portfolio :</i> <i>High prospective yield</i></p> <p><i>Bottom portfolio :</i> <i>Low prospective yield</i></p> <p>Code : PEY_12M, PEY_24M</p>	<p>IBES Estimates</p>	<p>a) (Rolling 12 month consensus forecast earnings per share / Closing market price)*100 b) (Rolling 24 month consensus forecast earnings per share / Closing market price)*100</p>	<ul style="list-style-type: none"> • Traditional 'value' proxy incorporating earnings expectations. • Stocks might have perceived 'value' due to the lag on estimate revisions after anticipatory price movements. However this should be a temporary phenomenon as analysts revise forecasts in response to price changes - further abated by the inclusion of estimate revision factors. • Can provide powerful results if implemented with other 'growth' and 'quality' factors in bivariate screening models. • Inverting price to prospective earnings ratio will result in the collection of prospective loss making stocks in the bottom portfolio, though the relative performance of this group may be investigated by exclusion through time.

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p>17 Revenue growth</p> <p>Stocks with real perceived growth rates should outperform through time.</p> <p><i>Top portfolio : High growth</i></p> <p><i>Bottom portfolio : Low growth</i></p> <p>Code : RGR</p>	<p>Worldscope</p>	<p>$((\text{Current years Net Sales or Revenues} / \text{Previous years Net sales or Revenues}) - 1) * 100$</p> <p>For industrial companies revenue represents gross sales and other operating revenues less discounts, returns and other allowances; banks, insurance and other financial companies revenues represent the total operating revenue of the company.</p>	<ul style="list-style-type: none"> • Revenue growth often used as a proxy for ‘quality’ and real short term ‘growth’. • Does not provide any insight on profit margin performance though screen can be constructed with earnings factors in a bivariate sort to discriminate on ‘quality’ of growth. • Reduced universe of companies with available data and vagaries in definition and recognition of revenue will impart some noise in results through time. • Lag incorporated on assimilation of data to ensure data item is available at the time of portfolio formation.
<p>18 Rate of re-investment</p> <p>Growth and emerging growth stocks with high internal growth rates should outperform through time.</p> <p><i>Top portfolio : High rate of re-investment</i></p> <p><i>Bottom portfolio : Low rate of re-</i></p>	<p>IFC</p>	<p>$(\text{Last 12 months trailing earnings per share} - \text{Last 12 months dividend per share}) / (\text{Last year book value per share}) * 100$</p> <p>Note : See earnings yield, dividend yield and book to price ratio factors above for definitions on ratio constituents.</p>	<ul style="list-style-type: none"> • Rate of reinvestment used to discriminate ‘growth’ companies that provide higher rates of returns on invested capital but reinvest earnings to generate internal growth rather than returning capital to shareholders. • It is generally considered sound corporate policy, usually in the interest of shareholders, to retain an appreciable amount of an average years’ earnings to, inter alia, strengthen liquidity, invest in infrastructure and product expansion, prepare for ‘rainy days’ and maintain dividend rate in low earning years. • If the firm has good prospects, we would expect a high reinvestment rate. • Usually has high correlation with other growth and “quality” proxies.

Factor, hypothesis and ranking strategy	Data source	Formula and definitions ⁶	Interpretation
<p><i>investment</i></p> <p>Code : RIR</p>			
<p>19 Return on equity</p> <p>High ‘quality’ stocks should outperform poorer ‘quality’ through time.</p> <p><i>Top portfolio :</i> <i>High return on equity</i></p> <p><i>Bottom portfolio :</i> <i>Low return on equity</i></p> <p>Code : ROE</p>	IFC	<p>(Last 12 months trailing Earnings per share / last year book value per share)*100</p> <p>Note : See earnings yield and book to price ratio factors above for definitions on ratio constituents.</p>	<ul style="list-style-type: none"> • Return on equity fundamental in screening of companies providing returns on invested capital. • Good traditional ‘quality’ and risk proxy to investigate the performance differential between perceived ‘good’ and ‘bad’ stocks through time. • While nominal ROE does not provide significant insight into a stocks ability to create intrinsic value. It is thought to be a good and simple proxy for management quality and the ability of management to leverage rate of return on equity by incurring debt. • Return on equity will to a degree demonstrate the efficiency of the company’s management of assets, the ability to meet competitive challenges and implement a pricing strategy, the ability to weather credit market conditions and to instill an overall financial policy and the ability to take advantage of fiscal incentives. • Though there are perceived benefits in the use of advanced return and value ratios, data quality and history often preclude their effective implementation. • High ROE stocks are visible ‘quality’ stocks and sometimes trade on high multiples.

4. Results

4.1 Market settings in South Africa

While parallels between developments in both Latin American countries and Asian countries are visible, the characteristics of the South African market are relatively unique. The closed nature of the economy and markets prior to the transition from Apartheid make it difficult to draw inference from the closed period that would be appropriate for the open period. As a result, we have a very short sample for this country.

Even within this short period (since 1993), it covers a time of very rapid transformation. In January 1993, the new IFC index covered 62 companies and had a market capitalization of US\$66 billion. The index peaked at US\$120 billion in January 1996 but has subsequently fallen to US\$92 billion (end 1997) or 73% GDP.

The liberalization of the economy initially led to a surge in domestic demand, fuelled by easy monetary policy, however, by 1996 the inflationary impact became clear and the South Africa Reserve Bank moved quickly to tighten policy. Credit growth failed to respond quickly and with increasing pressure on the Rand, following the 1997 Asian crisis, interest rates have been forced to stay high, despite clear signs of economic deceleration. Falling international gold and other industrial commodity prices have further dampened market sentiment (mining stocks represented 20% of the IFCG index at end 1997).

Another unique characteristic of the economy and equity market is the mismatch between different sectors. The regulatory environment of the market and accounting practices of the majority of corporations are advanced relative to other emerging markets, however, the economy is very sensitive to changes in international commodity prices. There is also substantial political risk as the country struggles to deal with the years of Apartheid.

For an up-to-date detailed chronology of important, financial, economic and political events in South Africa, see

http://www.duke.edu/~charvey/Country_risk/chronology/chronology_index.htm

4.2. Screening results for South Africa

Due to the nature of the South African economy, with a large mining and commodity cyclical influence, the process of screening will be influenced by important exogenous factors such as the price of gold and other commodity prices. To assess the sensitivity to these exogenous influences, screens were re-run (but not reported) excluding metal mining firms.

During our sample, the South African index return averaged 18.86% per year. However, the index performance is significantly different in the in-sample and out-of-sample periods. The market returned an average 41% per year for the years 1993 through the end of 1995. Since the beginning of 1996, the average market return is -1.9% per year. Over the entire sample (63 observations) since January 1993, the market increased in 40 months (63% of the time) and decreased in 23 months (37% of the time). During the out of sample period the market increased in 13 months and decreased in 15 months.

Factor screens

Exhibit 5A-V presents an example of the factor by factor Exhibit 24 summarizes these results. These exhibits only contain the value-weighted portfolio returns. Exhibit 6 summarizes these results. The average returns of the highest and lowest fractile portfolios are presented in Exhibit 7. Further, the percent of periods that the top and bottom fractile outperformed the benchmark is presented in Exhibit 8.

Some general observations are:

- The highest average annualized excess returns are earned from earnings yield and change in consensus FY1 estimate over the preceding three month strategies with excess returns over the benchmark of 8.0% and 7.85% respectively. The benchmark return is 18.86%.
- The greatest average annualized underperformance against the benchmark are obtained from bottom portfolio change in consensus FY1 estimate over the last three and six months with -12.93% and -8.71% respectively. Though these two factors do exhibit high correlations, the different horizons produce different behavior in various stages of a dichotomous market. Book to price ratio delivered marginally worse results with a -8.42% bottom portfolio average annual excess return.
- The greatest top minus bottom spread differential is produced by change in consensus FY1 estimate over the preceding three months and consensus forecast estimate revision ratio with 20.78% and 15.44% respectively.
- These two strategies are also the most successful in terms of benchmark outperformance, beating the benchmark in 61.90% (consensus revision ratio) and 60.32% (last three months estimate change). Earnings yield and rate of re-investment produced similar results to the latter. Although rate of re-investment outperformed consistently over the sample period the average annual excess returns over the benchmark was disappointing due mainly to poor performance in the large bull market of 1993. Exogenous factors such as the price of gold may confound these results. These factors were also the best performers in an up market.

- The best performers in a down market are market capitalization with outperformance in 73.91% of down markets, though the strategy was particularly hard hit in the last quarter of 1997. Return on equity, as expected performed well in down markets outperforming in almost 70% of observed down markets.
- ‘Growth’ and forecast earnings revision related factors have exhibited the greatest last two year performance where the value of \$100 increased to \$136.44 for companies exhibiting high revenue growth, and to \$132.11 for top portfolio consensus revision. During this period a passive investment in the benchmark rose in value to \$101.59.

[Insert Exhibits 5, 6, 7, 8 here]

Fundamental factors

Our ‘value’ and ‘growth’ screens as expected perform differently through time with ‘growth’ proxies showing outperformance in the last two years. What is remarkable is the shift in factor performance through our sample period. However, the earnings yield factor does deliver consistent performance and outperforms the benchmark on a value-weighted basis in five out of six years and a factor relative score of 2.5. Book to price yield provided average equal weighted annual outperformance of 6.06% a year though this turned into a -1.10% average annual underperformance when the post rank returns were value-weighted. As seen in Malaysia, this reflects a ‘size effect’ occurring within the top portfolio. For example, the average small capitalization-large capitalization annualized spread within that portfolio is 17.2%, while the same spread in the bottom portfolio is 11.5% (these numbers are based on our unreported bivariate analysis of size and the screening factor). The longer horizon 24 months prospective earnings yield screen generates higher average excess annual returns over the benchmark than the shorter 12 month expectation (4.22% compared to 1.87%) though this factor does underperform in the volatile markets of 1997.

Expectation factors

Expectation revision screens (change in consensus FY1 forecasts over the preceding three or six months and consensus estimate revision ratios) provide the highest top minus bottom return spreads and on average the highest annualized benchmark outperformance. They are strong in both up and down markets with all factors providing more than 5% excess returns a year in both down markets of 1996 and 1997, while also outperforming substantially in the bull markets of 1993. This is consistent across all capitalizations (not reported) in the top portfolio and seems to be particularly effective at discriminating on large capitalization’s in the bottom portfolio, with this group underperforming by an average annual -13.89%. Though the frequency of estimate revisions and magnitude of variation from mean estimates will increase in volatile macroeconomic environments, the consensus revision screen seems to have worked better in these type of markets (1997 through 1998). Exhibit 9 presents the year by year performance of the change in consensus earnings.

[Insert Exhibit 9 here]

Technical indicators

There seems to be little information in the momentum indicators.

Size effect

Small capitalization firms outperformed larger capitalization firms by on average 14.07% a year on an equal weighted basis and by 6.01% after value weighting the portfolio returns. Despite a massive outperformance of almost 70% in 1993 and over 20% in 1994, smaller capitalization stocks underperformed by almost 30% over the last two years of the sample. This is evidenced by the higher risk adjusted returns associated with this strategy.

The scoring screen

As mentioned previously, South Africa has a short in-sample screening window. Nevertheless, our final scoring model has delivered significant outperformance, before and after considering the effects of potential transaction costs [shown by the robust performance of longer-horizon holding periods]. Our monthly holding-period top portfolio has outperformed by 8.64% a year on average while the bottom portfolio has underperformed by -15.63% a year resulting in a top bottom spread of 24.27% a year. Though the average annual excess returns decrease incrementally with longer holding periods, during the out-of-sample period this difference is trivial. All screens outperform by more than 5% during the first part of 1998. For the purpose of the scoring screen, we report result through May 1998. The performance of the screens is presented in Exhibit 10. The scoring screens are summarized in Exhibits 11 and 12.

[Insert Exhibits 10A-C, 11, 12 here]

The percentage of periods whereby the benchmark return is exceeded is presented in Exhibit 13. The semi-annual holding period shows that the benchmark is exceeded in 70% of the observations. Importantly, the loser portfolio only exceeded the benchmark return in 10% of the periods.

[Insert Exhibit 13 here]

Consistency is also important. Exhibit 14 presents the year by year analysis of the scoring screen performance for the monthly rebalancing. In every year, the top portfolio outperforms the bottom portfolio.

[Insert Exhibit 14 here].

Exhibits 15 displays the performance of the scoring screens. An investment of \$100 at the beginning of our in-sample period (December 1992) grows to approximately \$320 by December 1995. In this same period, the benchmark grew to \$260 and the bottom portfolio grew to only \$170. An investment of \$100 in December 1995 (the beginning of

our out-of-sample period) falls to \$80 by March 1998 for the top portfolio compared to \$68 for the benchmark portfolio and \$44 for the bottom portfolio.

[Insert Exhibit 15 here].

A reasonable question to ask is whether we are just picking up some type of size effect. During the sample, small stocks outperformed large stocks. Exhibit 16 displays a bivariate analysis of the monthly-rebalanced scoring screen and market capitalization with data through March 1998. Across all size categories, the top fractile outperforms the bottom fractile. Not surprisingly, the best performing portfolio is the top fractile small stocks and the worst is the bottom fractile small stocks. If one knew in this in advance, the difference in the returns of these small stock portfolios averages 33% per year. The bivariate analysis of size provides evidence that the scoring screen is robust to the influence of size.

[Insert Exhibit 16 here]

5. Conclusions

The financial markets in Africa are in the process of liberalizing and there are large potential benefits in terms of both diversification and return performance for both foreign and domestic investors. Unfortunately, little is known about African markets. Erb, Harvey and Viskanta (1999) is one of the few studies to examine the risk characteristics at the national level.

We present the first examination of equity characteristics at the firm level. Our research examines 28 firm-specific variables in South Africa and shows that these variables can identify equities that will both out-perform and under-perform the standard benchmark. Our research suggests that extra return can be generated, over and above an indexed portfolio benchmark, by using the information in these characteristics. Of particular importance are characteristics that are forward looking, such as earnings forecasts from IBES.

Our research is not without caveats. The country that we examine, South Africa, is not necessarily representative of other African countries. Further, we are handicapped by an extremely short sample of data to calibrate our models. Nevertheless, our goal is to establish a framework for the examination of firm specific characteristics in investment strategies. Our method produces impressive performance in South Africa. Future research will examine other countries.

References

- Achour, Dana, Campbell R. Harvey, Greg Hopkins and Clive Lang, 1998, Stock selection in Emerging Markets: Portfolio Strategies for Malaysia, Mexico and South Africa, *Emerging Markets Quarterly* 2, 38-91.
- Achour, Dana, Campbell R. Harvey, Greg Hopkins and Clive Lang, 1999a, Stock selection in Malaysia, *Emerging Markets Quarterly* 3, 54-91.
- Achour, Dana, Campbell R. Harvey, Greg Hopkins and Clive Lang, 1999b, Stock selection in Mexico, *Emerging Markets Quarterly*, forthcoming.
- Bekaert, Geert, Claude B. Erb, Campbell R. Harvey and Tadas E. Viskanta, 1997, What matters for emerging market investment? *Emerging Markets Quarterly* 1:2, 17-46.
- Bekaert, Geert, Campbell R. Harvey and Robin L. Lumsdaine, 1999, Structural breaks in emerging market capital flows, Unpublished working paper, Duke University, Durham, NC.
- Bernstein, Richard, 1995, *Style investing: Unique insight into equity management*, John Wiley and Sons, New York, NY.
- Choe, Hyuk, Bond-Chan Kho and René M. Stulz, 1999, Do foreign investors destabilize stocks markets? The Korean experience in 1997, Unpublished working paper, the Ohio State University, Columbus, OH.
- Claessens, Stijn, Susmita Dasgupta and Jack Glen, 1998, The cross-sectional of stock returns: Evidence from the emerging markets, *Emerging Markets Quarterly*, Winter 1998, 4-13.
- Erb, Claude B., Campbell R. Harvey and Tadas E. Viskanta, 1999, The risk and expected returns of African equity investments, in Cathy Pattillo, Ed., *Risk and Agencies of Restraint: Reducing the Perceived Risks of African Investment*, (MacMillan), forthcoming.
- Froot, Kenneth A., Paul G. J. O'Connell and Mark S. Seasholes, 1999, The portfolio flows of international investors, I, Unpublished working paper, Harvard University, Cambridge, MA.
- Graham, Benjamin and D. Dodd, 1934, *Security analysis*, McGraw-Hill, New York.
- Harvey, Campbell R., 1995, Predictable risk and returns in emerging markets, *Review of Financial Studies*, 773-816.
- Harvey, Campbell R., Christian Lundblad and Diego Valderrama, 1999, Brazil in crisis, *Emerging Markets Quarterly* 3, 4-9.
- Rouwenhorst, Geert, 1998, Local return factors and turnover in emerging stock markets, Unpublished working paper, Yale University.

SHORT BIOGRAPHIES

Dana Achour is Managing Director of Portfolio Management Group at Merrill Lynch Global Asset Management Ltd. in London.

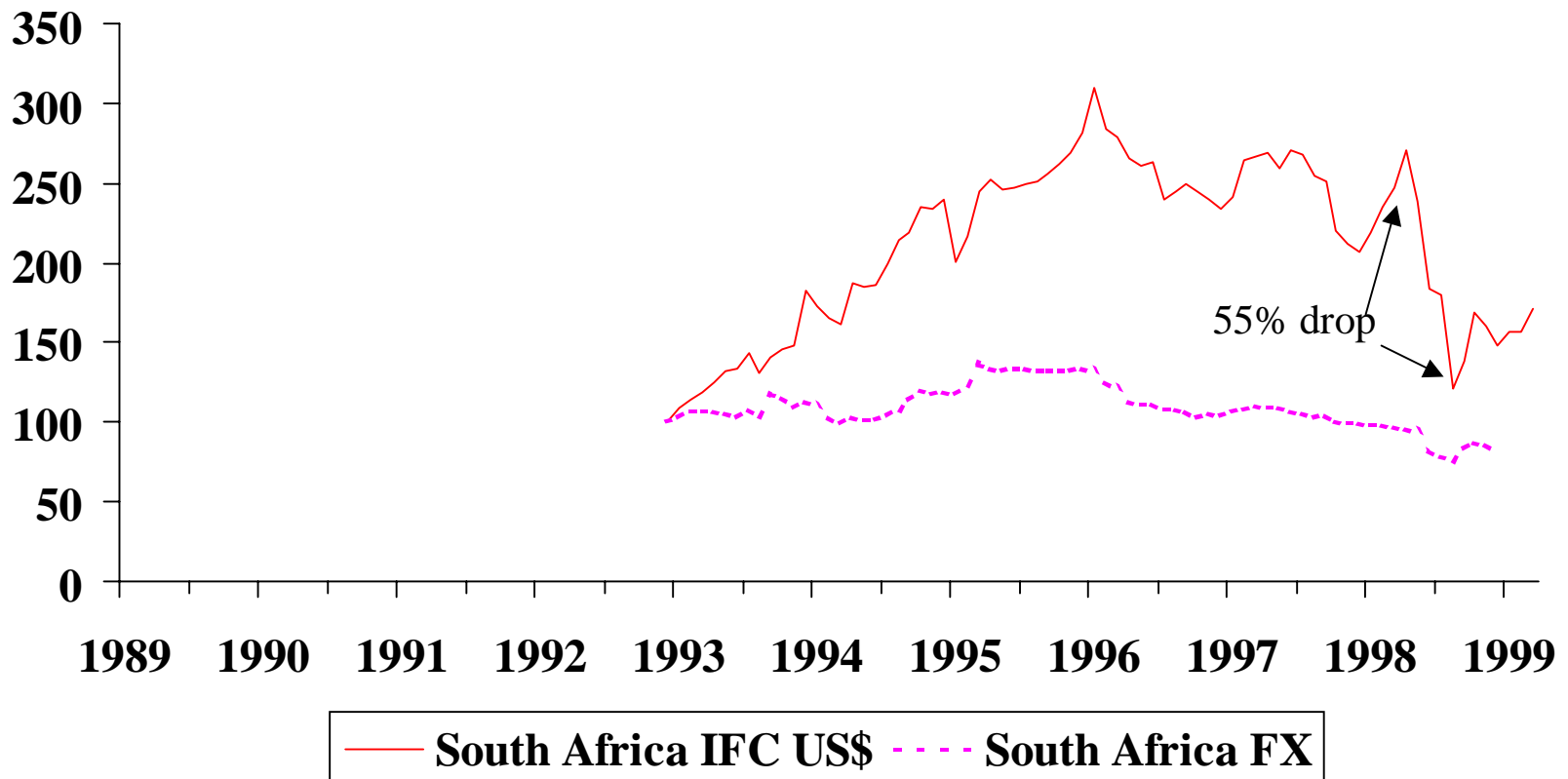
Campbell R. Harvey is J. Paul Sticht Professor of International Business at Duke University in Durham, NC and a Research Associate with the National Bureau of Economic Research in Cambridge, MA.

Greg Hopkins is an Emerging Market Analyst at Merrill Lynch Global Asset Management Ltd. in London.

Clive Lang is Managing Director of Asset Management at Merrill Lynch Global Asset Management Ltd. in London.

EXHIBIT 1

Performance of US\$100 invested in South Africa equities and foreign exchange



Data through March 1999

EXHIBIT 5 A

Factor Performance for South Africa	
Screen Name:	Market Capitalization
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	24.75	11.98	18.74	18.86
Cumulative return (indexed at 100 - start)	2	319.32	181.11	246.43	247.68
STD Deviation of returns	3	25.55	22.21	23.29	22.01
Average annual excess return	Rm 4	5.89	-6.88	-0.11	
	Rf 5	19.34	7.08	13.58	
STD Deviation of excess rtns	Rm 6	13.97	9.17	3.59	
	Rf 7	25.64	22.26	23.32	
Systematic risk (Beta)	9	0.97	0.92	1.05	
Alpha	10	5.41	-4.68	-0.90	
Co-efficient of determination	11				
Average market cap	12				7026.16
% periods > Benchmark	13	57.14	41.27	52.38	
% periods > Bench up Mkt	14	47.50	32.50	65.00	
% periods > Bench Dn Mkt	15	73.91	56.52	30.43	
Max # of consecutive benchmark outperformance	16	6	3	6	
Maximum positive excess return	17	12.88	5.16	2.25	
Maximum negative excess return	18	-10.95	-6.11	-2.52	
% periods positive returns to negative	19	142.31	125.00	162.50	
% periods of negative returns	20	41.27	44.44	38.10	36.51
Max # consecutive negative periods	21	7	8	6	6
Max # consecutive positive periods	22	10	9	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		236.56	158.83	161.77	167.26
1994		151.57	145.06	123.50	131.32
1995		117.41	116.97	117.74	117.78
<hr/> <i>Out of sample</i> 1996		86.19	73.07	85.76	82.94
1997		68.94	74.55	92.12	88.51
<i>Through March</i> 1998		127.66	123.35	132.59	130.42
Relative Performance -	24				
1993		3	1	2	
1994		3	2	1	
1995		2	1	3	
1996		3	1	2	
1997		1	2	3	
1998		2	1	3	
Average Relative Performance -		2.33	1.33	2.33	
Cumulative annual returns -	25				
Last two years		71.75	76.00	110.16	101.59
Last five years		241.02	153.66	222.16	216.53
Factor average	26				#REF!
Factor median	27				4294.60
Factor standard deviation	28				1566.64

*All definitions in Exhibit 2

EXHIBIT 5 B

Factor Performance for South Africa	
Screen Name:	Change in return on equity
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	18.53	16.48	20.93	18.86
Cumulative return (indexed at 100 - start)	2	244.15	222.73	271.19	247.68
STD Deviation of returns	3	21.82	24.59	23.02	22.01
Average annual excess return	Rm 4	-0.32	-2.38	2.07	
	Rf 5	13.37	11.40	15.67	
STD Deviation of excess rtns	Rm 6	5.30	6.14	7.10	
	Rf 7	21.87	24.64	23.06	
Systematic risk (Beta)	9	0.96	1.09	0.99	
Alpha	10	0.38	-3.53	1.85	
Co-efficient of determination	11				
Average market cap	12				7457.20
% periods > Benchmark	13	53.97	44.44	50.79	
% periods > Bench up Mkt	14	50.00	45.00	55.00	
% periods > Bench Dn Mkt	15	60.87	43.48	43.48	
Max # of consecutive benchmark outperformance	16	6	7	6	
Maximum positive excess return	17	3.16	6.15	6.31	
Maximum negative excess return	18	-4.74	-4.20	-5.17	
% periods positive returns to negative	19	162.50	142.31	186.36	
% periods of negative returns	20	38.10	41.27	34.92	36.51
Max # consecutive negative periods	21	6	6	3	6
Max # consecutive positive periods	22	10	10	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		156.24	184.98	165.23	167.26
1994		148.40	131.26	126.44	131.32
1995		112.27	116.89	128.16	117.78
<hr/> <i>Out of sample</i> 1996		82.97	81.56	80.66	82.94
1997		89.29	79.05	94.34	88.51
<i>Through March</i> 1998		126.60	121.73	133.10	130.42
Relative Performance -	24				
1993		1	3	2	
1994		3	2	1	
1995		1	2	3	
1996		3	2	1	
1997		2	1	3	
1998		2	1	3	
Average Relative Performance -		2.00	1.83	2.17	
Cumulative annual returns -	25				
Last two years		104.27	79.55	110.16	101.59
Last five years		219.94	194.57	234.67	216.53
Factor average	26				1.99
Factor median	27				-0.25
Factor standard deviation	28				24.33

*All definitions in Exhibit 2

EXHIBIT 5 C

Factor Performance for South Africa	
Screen Name:	Debt to Common equity
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	16.18	19.08	14.72	18.86
Cumulative return (indexed at 100 - start)	2	219.78	250.14	205.62	247.68
STD Deviation of returns	3	22.79	25.78	26.54	22.01
Average annual excess return	Rm 4	-2.67	0.22	-4.14	
	Rf 5	11.12	13.90	9.71	
STD Deviation of excess rtns	Rm 6	9.35	11.33	10.51	
	Rf 7	22.82	25.84	26.59	
Systematic risk (Beta)	9	0.95	1.05	1.11	
Alpha	10	-1.36	-0.73	-5.56	
Co-efficient of determination	11				
Average market cap	12				7159.46
% periods > Benchmark	13	46.03	50.79	47.62	
% periods > Bench up Mkt	14	45.00	50.00	57.50	
% periods > Bench Dn Mkt	15	47.83	52.17	30.43	
Max # of consecutive benchmark outperformance	16	3	4	7	
Maximum positive excess return	17	5.05	9.24	7.39	
Maximum negative excess return	18	-9.08	-9.40	-7.46	
% periods positive returns to negative	19	162.50	162.50	110.00	
% periods of negative returns	20	38.10	38.10	47.62	36.51
Max # consecutive negative periods	21	5	7	6	6
Max # consecutive positive periods	22	8	10	5	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		139.17	194.28	182.67	167.26
1994		143.01	142.48	119.77	131.32
1995		130.36	108.64	109.86	117.78
<hr/> <i>Out of sample</i> 1996		75.98	88.99	89.24	82.94
1997		87.34	85.45	70.91	88.51
<i>Through March</i> 1998		127.64	109.38	135.19	130.42
Relative Performance -	24				
1993		1	3	2	
1994		3	2	1	
1995		3	1	2	
1996		1	2	3	
1997		3	2	1	
1998		2	1	3	
Average Relative Performance -		2.17	1.83	2.00	
Cumulative annual returns -	25				
Last two years		96.54	84.35	82.51	101.59
Last five years		226.82	209.17	159.37	216.53
Factor average	26				29.68
Factor median	27				22.07
Factor standard deviation	28				28.79

*All definitions in Exhibit 2

EXHIBIT 5 D

Factor Performance for South Africa	
Screen Name:	Dividend Yield
Sample period:	2 /93 - 3 /98
Number of observations:	62 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	18.42	20.73	16.29	18.32
Cumulative return (indexed at 100 - start)	2	239.49	264.73	218.13	238.53
STD Deviation of returns	3	27.34	22.40	24.90	22.17
Average annual excess return	Rm	4	0.09	2.41	-2.03
	Rf	5	13.24	15.46	11.20
STD Deviation of excess rtns	Rm	6	17.03	8.69	7.03
	Rf	7	27.42	22.43	24.95
Systematic risk (Beta)	9	0.97	0.93	1.08	
Alpha	10	0.67	3.17	-3.12	
Co-efficient of determination	11				
Average market cap	12				7258.02
% periods > Benchmark	13	50.00	58.06	50.00	
% periods > Bench up Mkt	14	46.15	53.85	51.28	
% periods > Bench Dn Mkt	15	56.52	65.22	47.83	
Max # of consecutive benchmark outperformance	16	4	6	3	
Maximum positive excess return	17	24.22	7.98	5.64	
Maximum negative excess return	18	-9.92	-7.18	-6.41	
% periods positive returns to negative	19	129.63	148.00	129.63	
% periods of negative returns	20	43.55	40.32	43.55	37.10
Max # consecutive negative periods	21	4	5	6	6
Max # consecutive positive periods	22	7	6	7	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		212.09	144.49	174.16	161.08
1994		140.96	137.86	121.75	131.32
1995		98.10	125.93	120.66	117.78
<hr/>					
<i>Out of sample</i> 1996		87.70	87.71	76.17	82.94
1997		71.54	95.12	85.44	88.51
<i>Through March</i> 1998		130.15	126.49	131.01	130.42
Relative Performance -	24				
1993		3	1	2	
1994		3	2	1	
1995		1	3	2	
1996		2	3	1	
1997		1	3	2	
1998		2	1	3	
Average Relative Performance -		2.00	2.17	1.83	
Cumulative annual returns -	25				
Last two years		72.07	110.73	98.64	101.59
Last five years		165.72	241.16	185.39	216.53
Factor average	26				3.04
Factor median	27				2.32
Factor standard deviation	28				2.40

*All definitions in Exhibit 2

EXHIBIT 5 E

Factor Performance for South Africa	
Screen Name:	One year historical earnings momentum
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	12.59	18.40	23.76	18.86
Cumulative return (indexed at 100 - start)	2	186.40	242.74	306.27	247.68
STD Deviation of returns	3	20.67	23.26	26.17	22.01
Average annual excess return	Rm	4	-6.26	-0.45	4.91
	Rf	5	7.67	13.25	18.40
STD Deviation of excess rtns	Rm	6	6.08	8.41	9.46
	Rf	7	20.72	23.29	26.22
Systematic risk (Beta)	9	0.90	0.99	1.11	
Alpha	10	-3.79	-0.14	2.12	
Co-efficient of determination	11				
Average market cap	12				7264.25
% periods > Benchmark	13	42.86	49.21	55.56	
% periods > Bench up Mkt	14	37.50	47.50	62.50	
% periods > Bench Dn Mkt	15	52.17	52.17	43.48	
Max # of consecutive benchmark outperformance	16	9	6	4	
Maximum positive excess return	17	3.94	5.67	7.41	
Maximum negative excess return	18	-6.35	-5.95	-5.20	
% periods positive returns to negative	19	125.00	133.33	152.00	
% periods of negative returns	20	44.44	42.86	39.68	36.51
Max # consecutive negative periods	21	6	6	5	6
Max # consecutive positive periods	22	10	6	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		155.14	150.93	182.05	167.26
1994		128.77	141.27	138.83	131.32
1995		108.36	127.09	117.97	117.78
<hr/> <i>Out of sample</i> 1996		80.61	79.58	89.25	82.94
1997		86.85	86.14	84.14	88.51
<i>Through March</i> 1998		122.99	130.67	136.81	130.42
Relative Performance -	24				
1993		2	1	3	
1994		1	3	2	
1995		1	3	2	
1996		2	1	3	
1997		3	2	1	
1998		1	2	3	
Average Relative Performance -		1.67	2.00	2.33	
Cumulative annual returns -	25				
Last two years		97.62	94.68	101.59	101.59
Last five years		169.29	236.27	242.53	216.53
Factor average	26				24.23
Factor median	27				12.61
Factor standard deviation	28				64.83

*All definitions in Exhibit 2

EXHIBIT 5 F

Factor Performance for South Africa	
Screen Name:	Three year historical earnings growth rate
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	13.12	19.40	19.22	18.86
Cumulative return (indexed at 100 - start)	2	191.06	253.62	251.62	247.68
STD Deviation of returns	3	21.60	22.06	25.90	22.01
Average annual excess return	Rm	4	-5.73	0.54	0.36
	Rf	5	8.18	14.20	14.03
STD Deviation of excess rtns	Rm	6	7.91	6.74	8.97
	Rf	7	21.62	22.09	25.97
Systematic risk (Beta)	9	0.92	0.96	1.11	
Alpha	10	-3.56	1.24	-1.60	
Co-efficient of determination	11				
Average market cap	12				7341.63
% periods > Benchmark	13	50.79	49.21	53.97	
% periods > Bench up Mkt	14	42.50	42.50	57.50	
% periods > Bench Dn Mkt	15	65.22	60.87	47.83	
Max # of consecutive benchmark outperformance	16	8	7	6	
Maximum positive excess return	17	4.65	6.16	8.54	
Maximum negative excess return	18	-7.22	-6.72	-4.79	
% periods positive returns to negative	19	133.33	152.00	133.33	
% periods of negative returns	20	42.86	39.68	42.86	36.51
Max # consecutive negative periods	21	5	6	10	6
Max # consecutive positive periods	22	6	10	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		139.77	162.68	195.85	167.26
1994		126.36	125.47	145.75	131.32
1995		112.10	126.94	115.89	117.78
<hr/> <i>Out of sample</i> 1996		78.66	85.38	82.18	82.94
1997		91.89	90.04	72.48	88.51
<i>Through March</i> 1998		133.51	127.32	127.70	130.42
Relative Performance -	24				
1993		1	2	3	
1994		2	1	3	
1995		1	3	2	
1996		1	3	2	
1997		3	2	1	
1998		3	1	2	
Average Relative Performance -		1.83	2.00	2.17	
Cumulative annual returns -	25				
Last two years		108.46	102.97	78.20	101.59
Last five years		186.62	225.16	193.19	216.53
Factor average	26				11.49
Factor median	27				11.07
Factor standard deviation	28				22.39

*All definitions in Exhibit 2

EXHIBIT 5 G

Factor Performance for South Africa	
Screen Name:	Earnings yield
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	26.86	12.51	12.00	18.86
Cumulative return (indexed at 100 - start)	2	348.72	185.69	181.33	247.68
STD Deviation of returns	3	25.82	21.92	23.49	22.01
Average annual excess return	Rm	4	8.00	-6.35	-6.85
	Rf	5	21.37	7.59	7.11
STD Deviation of excess rtns	Rm	6	10.94	6.98	9.06
	Rf	7	25.87	21.95	23.54
Systematic risk (Beta)	9	1.06	0.95	0.98	
Alpha	10	5.51	-4.61	-5.75	
Co-efficient of determination	11				
Average market cap	12				7208.17
% periods > Benchmark	13	60.32	41.27	49.21	
% periods > Bench up Mkt	14	62.50	40.00	45.00	
% periods > Bench Dn Mkt	15	56.52	43.48	56.52	
Max # of consecutive benchmark outperformance	16	7	3	6	
Maximum positive excess return	17	13.78	3.72	7.25	
Maximum negative excess return	18	-12.42	-6.18	-5.44	
% periods positive returns to negative	19	186.36	162.50	125.00	
% periods of negative returns	20	34.92	38.10	44.44	36.51
Max # consecutive negative periods	21	6	6	6	6
Max # consecutive positive periods	22	10	8	10	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		190.38	140.40	162.12	167.26
1994		145.06	130.86	120.84	131.32
1995		120.35	119.35	113.30	117.78
<hr/>					
<i>Out of sample</i> 1996		98.24	72.20	73.44	82.94
1997		81.29	91.68	84.07	88.51
<i>Through March</i> 1998		131.39	127.93	132.31	130.42
Relative Performance -	24				
1993		3	1	2	
1994		3	2	1	
1995		3	2	1	
1996		3	1	2	
1997		1	3	2	
1998		2	1	3	
Average Relative Performance -		2.50	1.67	1.83	
Cumulative annual returns -	25				
Last two years		100.96	100.00	90.02	101.59
Last five years		285.25	173.49	167.41	216.53
Factor average	26				6.22
Factor median	27				5.53
Factor standard deviation	28				3.67

*All definitions in Exhibit 2

EXHIBIT 5 H

Factor Performance for South Africa	
Screen Name:	Change in Consensus FY1 estimate - Last 3 months
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	26.71	17.74	5.93	18.86
Cumulative return (indexed at 100 - start)	2	346.50	235.72	135.31	247.68
STD Deviation of returns	3	24.25	23.67	23.73	22.01
Average annual excess return	Rm 4	7.85	-1.11	-12.93	
	Rf 5	21.22	12.62	1.28	
STD Deviation of excess rtns	Rm 6	8.24	8.35	11.60	
	Rf 7	24.30	23.71	23.78	
Systematic risk (Beta)	9	1.04	1.01	0.94	
Alpha	10	5.87	-1.07	-10.62	
Co-efficient of determination	11				
Average market cap	12				7308.74
% periods > Benchmark	13	60.32	49.21	34.92	
% periods > Bench up Mkt	14	62.50	47.50	32.50	
% periods > Bench Dn Mkt	15	56.52	52.17	39.13	
Max # of consecutive benchmark outperformance	16	9	5	3	
Maximum positive excess return	17	6.89	9.42	9.06	
Maximum negative excess return	18	-8.29	-6.63	-12.36	
% periods positive returns to negative	19	186.36	133.33	103.23	
% periods of negative returns	20	34.92	42.86	49.21	36.51
Max # consecutive negative periods	21	4	7	10	6
Max # consecutive positive periods	22	10	8	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		187.00	155.13	148.48	167.26
1994		130.06	141.69	131.26	131.32
1995		119.02	134.16	100.72	117.78
<hr/> <i>Out of sample</i> 1996		90.22	75.29	78.26	82.94
1997		101.25	80.88	69.65	88.51
<i>Through March</i> 1998		131.05	131.26	126.44	130.42
Relative Performance -	24				
1993		3	2	1	
1994		1	3	2	
1995		2	3	1	
1996		3	1	2	
1997		3	2	1	
1998		2	3	1	
Average Relative Performance -		2.33	2.33	1.33	
Cumulative annual returns -	25				
Last two years		125.72	91.74	67.11	101.59
Last five years		292.39	225.20	116.28	216.53
Factor average	26				-2.39
Factor median	27				-0.64
Factor standard deviation	28				16.95

*All definitions in Exhibit 2

EXHIBIT 5 I

Factor Performance for South Africa	
Screen Name:	Change in Consensus FY1 estimate - Last 6 months
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	23.70	17.14	10.14	18.86
Cumulative return (indexed at 100 - start)	2	305.49	229.43	166.02	247.68
STD Deviation of returns	3	25.14	23.44	23.98	22.01
Average annual excess return	Rm 4	4.85	-1.72	-8.72	
	Rf 5	18.34	12.03	5.32	
STD Deviation of excess rtns	Rm 6	8.40	9.05	11.39	
	Rf 7	25.18	23.48	24.03	
Systematic risk (Beta)	9	1.08	0.98	0.96	
Alpha	10	2.68	-1.17	-7.01	
Co-efficient of determination	11				
Average market cap	12				7341.69
% periods > Benchmark	13	50.79	50.79	42.86	
% periods > Bench up Mkt	14	52.50	55.00	35.00	
% periods > Bench Dn Mkt	15	47.83	43.48	56.52	
Max # of consecutive benchmark outperformance	16	5	6	5	
Maximum positive excess return	17	9.97	8.25	10.19	
Maximum negative excess return	18	-7.09	-8.70	-9.54	
% periods positive returns to negative	19	186.36	162.50	85.29	
% periods of negative returns	20	34.92	38.10	53.97	36.51
Max # consecutive negative periods	21	4	4	6	6
Max # consecutive positive periods	22	8	7	6	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		175.72	160.86	152.31	167.26
1994		131.69	139.86	135.86	131.32
1995		113.68	126.41	117.16	117.78
<hr/> <i>Out of sample</i> 1996		87.45	75.66	83.04	82.94
1997		97.09	85.05	67.69	88.51
<i>Through March</i> 1998		136.76	125.37	121.82	130.42
Relative Performance -	24				
1993		3	2	1	
1994		1	3	2	
1995		1	3	2	
1996		3	1	2	
1997		3	2	1	
1998		3	2	1	
Average Relative Performance -		2.33	2.17	1.50	
Cumulative annual returns -	25				
Last two years		122.81	91.94	66.33	101.59
Last five years		274.00	211.00	138.26	216.53
Factor average	26				-4.74
Factor median	27				-2.21
Factor standard deviation	28				21.62

*All definitions in Exhibit 2

EXHIBIT 5 J

Factor Performance for South Africa	
Screen Name:	Consensus FY2 to FY1 estimate change
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	20.59	14.45	19.47	18.86
Cumulative return (indexed at 100 - start)	2	267.22	203.13	254.41	247.68
STD Deviation of returns	3	22.38	22.75	26.03	22.01
Average annual excess return	Rm	4	1.73	-4.41	0.61
	Rf	5	15.35	9.46	14.27
STD Deviation of excess rtns	Rm	6	8.40	8.06	9.35
	Rf	7	22.42	22.78	26.07
Systematic risk (Beta)	9	0.94	0.97	1.11	
Alpha	10	2.44	-3.25	-1.37	
Co-efficient of determination	11				
Average market cap	12				7345.30
% periods > Benchmark	13	50.79	42.86	53.97	
% periods > Bench up Mkt	14	42.50	40.00	62.50	
% periods > Bench Dn Mkt	15	65.22	47.83	39.13	
Max # of consecutive benchmark outperformance	16	6	3	4	
Maximum positive excess return	17	8.64	4.30	11.16	
Maximum negative excess return	18	-6.11	-7.18	-10.55	
% periods positive returns to negative	19	162.50	186.36	152.00	
% periods of negative returns	20	38.10	34.92	39.68	36.51
Max # consecutive negative periods	21	4	5	6	6
Max # consecutive positive periods	22	8	12	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		151.16	155.90	181.26	167.26
1994		162.30	113.55	134.98	131.32
1995		105.63	129.05	117.09	117.78
<hr/> <i>Out of sample</i> 1996		82.77	79.39	89.35	82.94
1997		92.64	90.14	75.99	88.51
<i>Through March</i> 1998		134.48	124.25	130.79	130.42
Relative Performance -	24				
1993		1	2	3	
1994		3	1	2	
1995		1	3	2	
1996		2	1	3	
1997		3	2	1	
1998		3	1	2	
Average Relative Performance -		2.17	1.67	2.17	
Cumulative annual returns -	25				
Last two years		109.44	102.44	86.47	101.59
Last five years		246.48	182.72	217.78	216.53
Factor average	26				24.44
Factor median	27				20.58
Factor standard deviation	28				29.47

*All definitions in Exhibit 2

EXHIBIT 5 K

Factor Performance for South Africa	
Screen Name:	Consensus forecast earnings estimate revision ratio
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	26.69	16.33	11.25	18.86
Cumulative return (indexed at 100 - start)	2	346.28	221.26	175.05	247.68
STD Deviation of returns	3	23.51	23.07	23.50	22.01
Average annual excess return	Rm 4	7.83	-2.53	-7.60	
	Rf 5	21.21	11.26	6.39	
STD Deviation of excess rtns	Rm 6	6.85	5.91	10.58	
	Rf 7	23.56	23.12	23.54	
Systematic risk (Beta)	9	1.02	1.01	0.95	
Alpha	10	6.11	-2.40	-5.90	
Co-efficient of determination	11				
Average market cap	12				7285.03
% periods > Benchmark	13	61.90	42.86	38.10	
% periods > Bench up Mkt	14	62.50	45.00	30.00	
% periods > Bench Dn Mkt	15	60.87	39.13	52.17	
Max # of consecutive benchmark outperformance	16	6	6	6	
Maximum positive excess return	17	7.00	4.06	10.38	
Maximum negative excess return	18	-4.02	-5.59	-9.80	
% periods positive returns to negative	19	173.91	142.31	142.31	
% periods of negative returns	20	36.51	41.27	41.27	36.51
Max # consecutive negative periods	21	4	6	5	6
Max # consecutive positive periods	22	8	8	7	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		184.59	162.22	147.20	167.26
1994		126.00	142.95	134.17	131.32
1995		119.31	126.54	110.27	117.78
<hr/> <i>Out of sample</i> 1996		89.64	77.73	82.26	82.94
1997		99.10	83.46	77.40	88.51
<i>Through March</i> 1998		140.48	116.24	126.23	130.42
Relative Performance -	24				
1993		3	2	1	
1994		1	3	2	
1995		2	3	1	
1996		3	1	2	
1997		3	2	1	
1998		3	1	2	
Average Relative Performance -		2.50	2.00	1.50	
Cumulative annual returns -	25				
Last two years		132.11	85.08	78.72	101.59
Last five years		302.57	198.16	154.14	216.53
Factor average	26				-0.03
Factor median	27				0.00
Factor standard deviation	28				0.00

*All definitions in Exhibit 2

EXHIBIT 5 L

Factor Performance for South Africa	
Screen Name:	Book to price yield
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	17.76	19.54	10.44	18.86
Cumulative return (indexed at 100 - start)	2	235.90	255.22	168.44	247.68
STD Deviation of returns	3	26.07	23.41	21.88	22.01
Average annual excess return	Rm	4	-1.10	0.68	-8.42
	Rf	5	12.63	14.34	5.61
STD Deviation of excess rtns	Rm	6	11.89	5.84	8.17
	Rf	7	26.13	23.45	21.91
Systematic risk (Beta)	9	1.06	1.03	0.93	
Alpha	10	-1.91	0.05	-6.12	
Co-efficient of determination	11				
Average market cap	12				7208.50
% periods > Benchmark	13	49.21	55.56	42.86	
% periods > Bench up Mkt	14	45.00	57.50	37.50	
% periods > Bench Dn Mkt	15	56.52	52.17	52.17	
Max # of consecutive benchmark outperformance	16	5	6	4	
Maximum positive excess return	17	11.83	3.60	4.76	
Maximum negative excess return	18	-11.52	-6.12	-6.67	
% periods positive returns to negative	19	152.00	162.50	117.24	
% periods of negative returns	20	39.68	38.10	46.03	36.51
Max # consecutive negative periods	21	5	6	6	6
Max # consecutive positive periods	22	8	8	5	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		188.54	162.33	143.60	167.26
1994		143.53	127.53	124.39	131.32
1995		112.42	127.35	112.06	117.78
<hr/> <i>Out of sample</i> 1996		88.31	83.74	71.70	82.94
1997		67.60	93.30	89.29	88.51
<i>Through March</i> 1998		129.89	123.91	131.44	130.42
Relative Performance -	24				
1993		3	2	1	
1994		3	2	1	
1995		2	3	1	
1996		3	2	1	
1997		1	3	2	
1998		2	1	3	
Average Relative Performance -		2.33	2.17	1.50	
Cumulative annual returns -	25				
Last two years		72.86	108.30	96.97	101.59
Last five years		185.30	231.38	166.19	216.53
Factor average	26				53.66
Factor median	27				36.23
Factor standard deviation	28				59.44

*All definitions in Exhibit 2

EXHIBIT 5 M

Factor Performance for South Africa	
Screen Name:	Cash Earnings to price yield
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	17.93	20.66	12.38	18.86
Cumulative return (indexed at 100 - start)	2	237.65	268.03	184.55	247.68
STD Deviation of returns	3	25.81	24.93	22.33	22.01
Average annual excess return	Rm 4	-0.93	1.80	-6.48	
	Rf 5	12.79	15.42	7.47	
STD Deviation of excess rtns	Rm 6	14.72	10.02	6.48	
	Rf 7	25.85	24.98	22.36	
Systematic risk (Beta)	9	0.96	1.04	0.97	
Alpha	10	-0.17	0.87	-5.17	
Co-efficient of determination	11				
Average market cap	12				7861.98
% periods > Benchmark	13	50.79	53.97	38.10	
% periods > Bench up Mkt	14	52.50	60.00	35.00	
% periods > Bench Dn Mkt	15	47.83	43.48	43.48	
Max # of consecutive benchmark outperformance	16	7	6	6	
Maximum positive excess return	17	10.86	8.04	3.32	
Maximum negative excess return	18	-12.22	-8.53	-4.94	
% periods positive returns to negative	19	162.50	142.31	117.24	
% periods of negative returns	20	38.10	41.27	46.03	36.51
Max # consecutive negative periods	21	7	8	6	6
Max # consecutive positive periods	22	9	8	4	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		154.87	182.56	144.29	167.26
1994		174.93	125.13	125.10	131.32
1995		126.22	128.44	108.66	117.78
<hr/> <i>Out of sample</i> 1996		80.83	86.88	79.58	82.94
1997		68.97	87.49	95.26	88.51
<i>Through March</i> 1998		124.66	120.18	124.11	130.42
Relative Performance -	24				
1993		2	3	1	
1994		3	2	1	
1995		2	3	1	
1996		2	3	1	
1997		1	2	3	
1998		3	1	2	
Average Relative Performance -		2.17	2.33	1.50	
Cumulative annual returns -	25				
Last two years		76.49	98.88	101.82	101.59
Last five years		219.98	232.00	179.70	216.53
Factor average	26				9.41
Factor median	27				7.98
Factor standard deviation	28				5.05

*All definitions in Exhibit 2

EXHIBIT 5 N

Factor Performance for South Africa	
Screen Name:	One month price momentum
Sample period:	2 /93 - 3 /98
Number of observations:	62 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	16.61	17.23	19.99	18.32
Cumulative return (indexed at 100 - start)	2	221.25	227.37	256.42	238.53
STD Deviation of returns	3	25.10	22.77	23.31	22.17
Average annual excess return	Rm	4	-1.71	-1.09	1.67
	Rf	5	11.51	12.10	14.75
STD Deviation of excess rtns	Rm	6	9.42	5.36	11.14
	Rf	7	25.15	22.80	23.35
Systematic risk (Beta)	9	1.05	1.00	0.93	
Alpha	10	-2.34	-0.91	2.67	
Co-efficient of determination	11				
Average market cap	12				7094.60
% periods > Benchmark	13	43.55	46.77	53.23	
% periods > Bench up Mkt	14	41.03	56.41	51.28	
% periods > Bench Dn Mkt	15	47.83	30.43	56.52	
Max # of consecutive benchmark outperformance	16	5	5	5	
Maximum positive excess return	17	7.69	4.41	6.21	
Maximum negative excess return	18	-5.19	-4.35	-8.87	
% periods positive returns to negative	19	121.43	158.33	158.33	
% periods of negative returns	20	45.16	38.71	38.71	37.10
Max # consecutive negative periods	21	4	6	5	6
Max # consecutive positive periods	22	9	8	7	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		172.61	150.86	158.54	161.08
1994		131.07	126.56	140.98	131.32
1995		118.80	115.54	120.84	117.78
<hr/> <i>Out of sample</i> 1996		80.23	83.10	91.24	82.94
1997		79.62	93.33	82.86	88.51
<i>Through March</i> 1998		128.86	132.87	125.57	130.42
Relative Performance -	24				
1993		3	1	2	
1994		2	1	3	
1995		2	1	3	
1996		1	2	3	
1997		1	3	2	
1998		2	3	1	
Average Relative Performance -		1.83	1.83	2.33	
Cumulative annual returns -	25				
Last two years		86.24	106.07	103.27	101.59
Last five years		174.62	215.51	251.29	216.53
Factor average	26				1.32
Factor median	27				0.62
Factor standard deviation	28				9.26

*All definitions in Exhibit 2

EXHIBIT 5 O

Factor Performance for South Africa	
Screen Name:	One year price momentum
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	18.21	15.61	17.65	18.86
Cumulative return (indexed at 100 - start)	2	240.65	214.15	234.72	247.68
STD Deviation of returns	3	24.98	23.21	26.23	22.01
Average annual excess return	Rm	4	-0.65	-3.25	-1.21
	Rf	5	13.06	10.57	12.52
STD Deviation of excess rtns	Rm	6	9.82	7.86	12.91
	Rf	7	25.01	23.26	26.28
Systematic risk (Beta)	9	1.04	0.99	1.04	
Alpha	10	-1.33	-2.68	-1.70	
Co-efficient of determination	11				
Average market cap	12				7223.75
% periods > Benchmark	13	46.03	33.33	58.73	
% periods > Bench up Mkt	14	45.00	27.50	57.50	
% periods > Bench Dn Mkt	15	47.83	43.48	60.87	
Max # of consecutive benchmark outperformance	16	4	3	9	
Maximum positive excess return	17	8.20	8.73	11.58	
Maximum negative excess return	18	-6.94	-9.00	-12.89	
% periods positive returns to negative	19	152.00	152.00	152.00	
% periods of negative returns	20	39.68	39.68	39.68	36.51
Max # consecutive negative periods	21	6	5	5	6
Max # consecutive positive periods	22	8	8	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		149.88	173.20	167.81	167.26
1994		132.53	120.36	151.05	131.32
1995		129.04	111.30	112.09	117.78
<hr/> <i>Out of sample</i> 1996		75.66	88.15	88.74	82.94
1997		91.72	83.91	70.38	88.51
<i>Through March</i> 1998		135.29	124.78	132.27	130.42
Relative Performance -	24				
1993		1	3	2	
1994		2	1	3	
1995		3	1	2	
1996		1	2	3	
1997		3	2	1	
1998		3	1	2	
Average Relative Performance -		2.17	1.67	2.17	
Cumulative annual returns -	25				
Last two years		109.32	92.38	80.38	101.59
Last five years		243.08	188.16	191.54	216.53
Factor average	26				16.39
Factor median	27				5.51
Factor standard deviation	28				50.95

*All definitions in Exhibit 2

EXHIBIT 5 P

Factor Performance for South Africa	
Screen Name:	12 months prospective earnings growth rate
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	16.31	16.55	24.04	18.86
Cumulative return (indexed at 100 - start)	2	221.00	223.47	309.94	247.68
STD Deviation of returns	3	21.76	25.16	22.93	22.01
Average annual excess return	Rm	4	-2.55	-2.31	5.19
	Rf	5	11.24	11.47	18.67
STD Deviation of excess rtns	Rm	6	6.95	7.56	10.02
	Rf	7	21.81	25.19	22.99
Systematic risk (Beta)	9	0.94	1.09	0.94	
Alpha	10	-1.14	-3.62	5.40	
Co-efficient of determination	11				
Average market cap	12				7325.54
% periods > Benchmark	13	42.86	49.21	50.79	
% periods > Bench up Mkt	14	42.50	52.50	42.50	
% periods > Bench Dn Mkt	15	43.48	43.48	65.22	
Max # of consecutive benchmark outperformance	16	4	6	7	
Maximum positive excess return	17	5.05	5.92	10.70	
Maximum negative excess return	18	-5.57	-7.29	-8.00	
% periods positive returns to negative	19	162.50	152.00	133.33	
% periods of negative returns	20	38.10	39.68	42.86	36.51
Max # consecutive negative periods	21	6	6	4	6
Max # consecutive positive periods	22	5	7	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		144.78	158.33	184.78	167.26
1994		147.67	127.08	138.99	131.32
1995		102.34	124.36	127.84	117.78
<hr/> <i>Out of sample</i> 1996		83.28	80.01	87.48	82.94
1997		90.98	86.54	83.90	88.51
<i>Through March</i> 1998		133.32	128.99	128.62	130.42
Relative Performance -	24				
1993		1	2	3	
1994		3	1	2	
1995		1	2	3	
1996		2	1	3	
1997		3	2	1	
1998		3	2	1	
Average Relative Performance -		2.17	1.67	2.17	
Cumulative annual returns -	25				
Last two years		109.60	100.07	92.65	101.59
Last five years		205.38	213.84	240.37	216.53
Factor average	26				66.68
Factor median	27				34.18
Factor standard deviation	28				142.40

*All definitions in Exhibit 2

EXHIBIT 5 Q

Factor Performance for South Africa	
Screen Name:	Three year prospective earnings growth rate
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	16.57	17.12	20.38	18.86
Cumulative return (indexed at 100 - start)	2	223.64	229.24	264.76	247.68
STD Deviation of returns	3	21.69	22.80	25.43	22.01
Average annual excess return	Rm 4	-2.29	-1.74	1.52	
	Rf 5	11.49	12.02	15.14	
STD Deviation of excess rtns	Rm 6	7.52	6.61	8.62	
	Rf 7	21.74	22.83	25.48	
Systematic risk (Beta)	9	0.93	0.99	1.09	
Alpha	10	-0.71	-1.34	-0.29	
Co-efficient of determination	11				
Average market cap	12				7359.14
% periods > Benchmark	13	44.44	50.79	47.62	
% periods > Bench up Mkt	14	47.50	52.50	52.50	
% periods > Bench Dn Mkt	15	39.13	47.83	39.13	
Max # of consecutive benchmark outperformance	16	4	6	4	
Maximum positive excess return	17	6.66	3.80	8.98	
Maximum negative excess return	18	-5.78	-6.36	-6.85	
% periods positive returns to negative	19	173.91	152.00	162.50	
% periods of negative returns	20	36.51	39.68	38.10	36.51
Max # consecutive negative periods	21	6	5	6	6
Max # consecutive positive periods	22	7	6	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		141.67	153.42	194.99	167.26
1994		144.22	129.06	132.60	131.32
1995		104.96	128.63	121.03	117.78
<hr/> <i>Out of sample</i> 1996		80.72	81.63	85.61	82.94
1997		94.98	88.19	75.65	88.51
<i>Through March</i> 1998		136.02	125.03	130.64	130.42
Relative Performance -	24				
1993		1	2	3	
1994		3	1	2	
1995		1	3	2	
1996		1	2	3	
1997		3	2	1	
1998		3	1	2	
Average Relative Performance -		2.00	1.83	2.17	
Cumulative annual returns -	25				
Last two years		112.92	97.46	88.95	101.59
Last five years		213.31	219.44	206.46	216.53
Factor average	26				26.52
Factor median	27				20.48
Factor standard deviation	28				28.90

*All definitions in Exhibit 2

EXHIBIT 5 R

Factor Performance for South Africa	
Screen Name:	24 month prospective earnings yield
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	23.07	14.63	15.36	18.86
Cumulative return (indexed at 100 - start)	2	297.41	204.82	211.72	247.68
STD Deviation of returns	3	24.24	23.64	23.62	22.01
Average annual excess return	Rm 4	4.22	-4.22	-3.50	
	Rf 5	17.73	9.63	10.33	
STD Deviation of excess rtns	Rm 6	10.04	7.89	8.63	
	Rf 7	24.28	23.68	23.67	
Systematic risk (Beta)	9	1.00	1.01	1.00	
Alpha	10	3.50	-3.88	-3.01	
Co-efficient of determination	11				
Average market cap	12				7329.23
% periods > Benchmark	13	58.73	46.03	44.44	
% periods > Bench up Mkt	14	60.00	42.50	40.00	
% periods > Bench Dn Mkt	15	56.52	52.17	52.17	
Max # of consecutive benchmark outperformance	16	7	4	5	
Maximum positive excess return	17	11.79	4.79	8.22	
Maximum negative excess return	18	-9.42	-5.14	-4.99	
% periods positive returns to negative	19	162.50	152.00	133.33	
% periods of negative returns	20	38.10	39.68	42.86	36.51
Max # consecutive negative periods	21	6	4	6	6
Max # consecutive positive periods	22	10	8	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		163.39	164.94	163.34	167.26
1994		142.52	123.61	132.20	131.32
1995		119.42	122.91	115.67	117.78
<hr/> <i>Out of sample</i> 1996		99.13	71.45	73.24	82.94
1997		81.38	93.21	86.14	88.51
<i>Through March</i> 1998		132.57	122.74	134.35	130.42
Relative Performance -	24				
1993		2	3	1	
1994		3	1	2	
1995		2	3	1	
1996		3	1	2	
1997		1	3	2	
1998		2	1	3	
Average Relative Performance -		2.17	2.00	1.83	
Cumulative annual returns -	25				
Last two years		101.67	98.19	95.81	101.59
Last five years		251.92	187.38	189.18	216.53
Factor average	26				8.91
Factor median	27				8.14
Factor standard deviation	28				3.66

*All definitions in Exhibit 2

EXHIBIT 5 S

Factor Performance for South Africa	
Screen Name:	12 month prospective earnings yield
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	20.73	19.18	13.01	18.86
Cumulative return (indexed at 100 - start)	2	268.81	251.20	190.06	247.68
STD Deviation of returns	3	24.25	24.05	24.11	22.01
Average annual excess return	Rm 4	1.87	0.32	-5.85	
	Rf 5	15.48	13.99	8.07	
STD Deviation of excess rtns	Rm 6	10.55	8.38	8.60	
	Rf 7	24.29	24.09	24.15	
Systematic risk (Beta)	9	0.99	1.02	1.02	
Alpha	10	1.73	-0.15	-5.52	
Co-efficient of determination	11				
Average market cap	12				7330.48
% periods > Benchmark	13	47.62	52.38	44.44	
% periods > Bench up Mkt	14	50.00	50.00	37.50	
% periods > Bench Dn Mkt	15	43.48	56.52	56.52	
Max # of consecutive benchmark outperformance	16	4	5	5	
Maximum positive excess return	17	11.89	5.32	7.15	
Maximum negative excess return	18	-9.42	-7.51	-6.37	
% periods positive returns to negative	19	162.50	173.91	125.00	
% periods of negative returns	20	38.10	36.51	44.44	36.51
Max # consecutive negative periods	21	6	4	6	6
Max # consecutive positive periods	22	10	8	10	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		171.62	166.26	155.63	167.26
1994		134.51	135.53	127.98	131.32
1995		116.44	131.94	112.96	117.78
<hr/> <i>Out of sample</i> 1996		97.63	70.69	74.25	82.94
1997		78.70	98.13	84.39	88.51
<i>Through March</i> 1998		130.17	121.80	134.82	130.42
Relative Performance -	24				
1993		3	2	1	
1994		2	3	1	
1995		2	3	1	
1996		3	1	2	
1997		1	3	2	
1998		2	1	3	
Average Relative Performance -		2.17	2.17	1.67	
Cumulative annual returns -	25				
Last two years		94.86	106.08	92.94	101.59
Last five years		226.57	228.21	171.94	216.53
Factor average	26				7.60
Factor median	27				6.94
Factor standard deviation	28				3.25

*All definitions in Exhibit 2

EXHIBIT 5 T

Factor Performance for South Africa	
Screen Name:	Revenue Growth
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	20.04	15.39	17.94	18.86
Cumulative return (indexed at 100 - start)	2	260.88	212.06	237.77	247.68
STD Deviation of returns	3	23.05	22.77	22.83	22.01
Average annual excess return	Rm 4	1.18	-3.46	-0.92	
	Rf 5	14.82	10.36	12.80	
STD Deviation of excess rtns	Rm 6	8.86	8.73	9.20	
	Rf 7	23.09	22.82	22.88	
Systematic risk (Beta)	9	0.97	0.96	0.95	
Alpha	10	1.57	-2.24	0.07	
Co-efficient of determination	11				
Average market cap	12				6469.58
% periods > Benchmark	13	52.38	50.79	52.38	
% periods > Bench up Mkt	14	55.00	42.50	50.00	
% periods > Bench Dn Mkt	15	47.83	65.22	56.52	
Max # of consecutive benchmark outperformance	16	7	4	5	
Maximum positive excess return	17	6.25	5.22	5.23	
Maximum negative excess return	18	-5.77	-8.52	-6.70	
% periods positive returns to negative	19	142.31	162.50	133.33	
% periods of negative returns	20	41.27	38.10	42.86	36.51
Max # consecutive negative periods	21	4	6	5	6
Max # consecutive positive periods	22	6	10	7	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		157.63	149.14	174.73	167.26
1994		125.03	145.54	140.41	131.32
1995		105.96	126.71	128.46	117.78
<hr/>					
<i>Out of sample</i> 1996		81.60	79.28	80.31	82.94
1997		111.98	81.41	75.69	88.51
<i>Through March</i> 1998		136.72	119.46	124.12	130.42
Relative Performance -	24				
1993		2	1	3	
1994		1	3	2	
1995		1	2	3	
1996		3	1	2	
1997		3	2	1	
1998		3	1	2	
Average Relative Performance -		2.17	1.67	2.17	
Cumulative annual returns -	25				
Last two years		136.44	88.28	77.09	101.59
Last five years		247.32	197.04	190.65	216.53
Factor average	26				16.75
Factor median	27				12.80
Factor standard deviation	28				29.39

*All definitions in Exhibit 2

EXHIBIT 5 U

Factor Performance for South Africa	
Screen Name:	Rate of re-investment
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	18.35	21.11	13.84	18.86
Cumulative return (indexed at 100 - start)	2	242.13	273.35	197.53	247.68
STD Deviation of returns	3	21.55	24.42	23.61	22.01
Average annual excess return	Rm	4	-0.51	2.25	-5.01
	Rf	5	13.19	15.85	8.87
STD Deviation of excess rtns	Rm	6	8.81	6.28	9.03
	Rf	7	21.57	24.47	23.67
Systematic risk (Beta)	9	0.90	1.07	0.99	
Alpha	10	1.32	0.61	-4.21	
Co-efficient of determination	11				
Average market cap	12				7238.10
% periods > Benchmark	13	60.32	46.03	49.21	
% periods > Bench up Mkt	14	55.00	55.00	50.00	
% periods > Bench Dn Mkt	15	69.57	30.43	47.83	
Max # of consecutive benchmark outperformance	16	8	3	6	
Maximum positive excess return	17	7.07	6.11	3.59	
Maximum negative excess return	18	-7.26	-3.27	-7.97	
% periods positive returns to negative	19	125.00	152.00	133.33	
% periods of negative returns	20	44.44	39.68	42.86	36.51
Max # consecutive negative periods	21	6	6	5	6
Max # consecutive positive periods	22	6	8	8	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		137.72	187.83	171.75	167.26
1994		137.32	125.69	141.42	131.32
1995		126.96	120.48	105.35	117.78
<hr/> <i>Out of sample</i> 1996		81.66	83.18	82.64	82.94
1997		95.47	90.00	73.92	88.51
<i>Through March</i> 1998		129.36	128.37	126.37	130.42
Relative Performance -	24				
1993		1	3	2	
1994		2	1	3	
1995		3	2	1	
1996		1	3	2	
1997		3	2	1	
1998		3	2	1	
Average Relative Performance -		2.17	2.17	1.67	
Cumulative annual returns -	25				
Last two years		118.54	100.20	74.17	101.59
Last five years		233.00	234.18	158.53	216.53
Factor average	26				7.11
Factor median	27				9.48
Factor standard deviation	28				30.03

*All definitions in Exhibit 2

EXHIBIT 5 V

Factor Performance for South Africa	
Screen Name:	Return on equity
Sample period:	1 /93 - 3 /98
Number of observations:	63 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	
Annualized average return (USD)	1	19.92	18.65	18.29	18.86
Cumulative return (indexed at 100 - start)	2	259.52	245.38	241.53	247.68
STD Deviation of returns	3	20.99	25.10	24.27	22.01
Average annual excess return	Rm 4	1.06	-0.21	-0.57	
	Rf 5	14.71	13.48	13.14	
STD Deviation of excess rtns	Rm 6	6.97	6.48	8.68	
	Rf 7	21.03	25.14	24.34	
Systematic risk (Beta)	9	0.90	1.11	1.03	
Alpha	10	2.56	-2.04	-1.01	
Co-efficient of determination	11				
Average market cap	12				7328.00
% periods > Benchmark	13	53.97	53.97	50.79	
% periods > Bench up Mkt	14	45.00	57.50	52.50	
% periods > Bench Dn Mkt	15	69.57	47.83	47.83	
Max # of consecutive benchmark outperformance	16	6	7	5	
Maximum positive excess return	17	4.25	5.98	4.35	
Maximum negative excess return	18	-4.17	-5.80	-6.18	
% periods positive returns to negative	19	162.50	152.00	162.50	
% periods of negative returns	20	38.10	39.68	38.10	36.51
Max # consecutive negative periods	21	5	6	5	6
Max # consecutive positive periods	22	10	8	10	8
Cumulative annual returns - (index=100 each year)	23				
<i>In Sample</i> 1993		153.94	173.22	186.97	167.26
1994		146.84	120.98	138.78	131.32
1995		128.00	119.81	109.27	117.78
<hr/> <i>Out of sample</i> 1996		79.96	82.29	87.71	82.94
1997		85.28	94.96	74.00	88.51
<i>Through March</i> 1998		131.53	125.06	131.25	130.42
Relative Performance -	24				
1993		1	2	3	
1994		3	1	2	
1995		3	2	1	
1996		1	2	3	
1997		2	3	1	
1998		3	1	2	
Average Relative Performance -		2.17	1.83	2.00	
Cumulative annual returns -	25				
Last two years		103.10	104.33	82.09	101.59
Last five years		237.42	213.86	202.70	216.53
Factor average	26				28.20
Factor median	27				16.91
Factor standard deviation	28				74.31

*All definitions in Exhibit 2

EXHIBIT 6

Factor performance summary - South Africa

	Sample Period	Number of observations	Average Annualised Return		Return Spread	Annualised Excess Returns		Std Deviation of Annualised Returns		Std Deviation of Top/Bottom spread returns	% Periods Benchmark Outperformance	
			Top	Bottom	Top/Bottom	Top	Bottom	Top	Bottom	Top	Bottom	
Market Capitalization	1 /93 - 3 /98	63	24.75	18.74	6.01	5.89	-0.11	25.55	23.29	16.84	57.14	52.38
Change in return on equity	1 /93 - 3 /98	63	18.53	20.93	-2.40	-0.32	2.07	21.82	23.02	10.34	53.97	50.79
Debt to Common equity	1 /93 - 3 /98	63	16.18	14.72	1.47	-2.67	-4.14	22.79	26.54	17.86	46.03	47.62
Dividend Yield	2 /93 - 3 /98	62	18.42	16.29	2.12	0.09	-2.03	27.34	24.90	19.51	50.00	50.00
One year historical earnings momentum	1 /93 - 3 /98	63	12.59	23.76	-11.17	-6.26	4.91	20.67	26.17	13.44	42.86	55.56
Three year historical earnings growth rate	1 /93 - 3 /98	63	13.12	19.22	-6.09	-5.73	0.36	21.60	25.90	15.44	50.79	53.97
Earnings yield	1 /93 - 3 /98	63	26.86	12.00	14.86	8.00	-6.85	25.82	23.49	18.39	60.32	49.21
Change in Consensus FY1 estimate - Last 3 months	1 /93 - 3 /98	63	26.71	5.93	20.78	7.85	-12.93	24.25	23.73	18.68	60.32	34.92
Change in Consensus FY1 estimate - Last 6 months	1 /93 - 3 /98	63	23.70	10.14	13.57	4.85	-8.72	25.14	23.98	18.41	50.79	42.86
Consensus FY2 to FY1 estimate change	1 /93 - 3 /98	63	20.59	19.47	1.12	1.73	0.61	22.38	26.03	15.89	50.79	53.97
Consensus forecast earnings estimate revision ratio	1 /93 - 3 /98	63	26.69	11.25	15.44	7.83	-7.60	23.51	23.50	16.65	61.90	38.10
Book to price yield	1 /93 - 3 /98	63	17.76	10.44	7.32	-1.10	-8.42	26.07	21.88	18.58	49.21	42.86
Cash Earnings to price yield	1 /93 - 3 /98	63	17.93	12.38	5.55	-0.93	-6.48	25.81	22.33	17.59	50.79	38.10
One month price momentum	2 /93 - 3 /98	62	16.61	19.99	-3.38	-1.71	1.67	25.10	23.31	18.83	43.55	53.23
One year price momentum	1 /93 - 3 /98	63	18.21	17.65	0.56	-0.65	-1.21	24.98	26.23	21.15	46.03	58.73
12 months prospective earnings growth rate	1 /93 - 3 /98	63	16.31	24.04	-7.74	-2.55	5.19	21.76	22.93	14.63	42.86	50.79
Three year prospective earnings growth rate	1 /93 - 3 /98	63	16.57	20.38	-3.81	-2.29	1.52	21.69	25.43	14.92	44.44	47.62
24 month prospective earnings yield	1 /93 - 3 /98	63	23.07	15.36	7.72	4.22	-3.50	24.24	23.62	17.37	58.73	44.44
12 month prospective earnings yield	1 /93 - 3 /98	63	20.73	13.01	7.71	1.87	-5.85	24.25	24.11	18.09	47.62	44.44
Revenue Growth	1 /93 - 3 /98	63	20.04	17.94	2.10	1.18	-0.92	23.05	22.83	16.80	52.38	52.38
Rate of re-investment	1 /93 - 3 /98	63	18.35	13.84	4.50	-0.51	-5.01	21.55	23.61	15.20	60.32	49.21
Return on equity	1 /93 - 3 /98	63	19.92	18.29	1.63	1.06	-0.57	20.99	24.27	12.65	53.97	50.79

EXHIBIT 7

Average Factor Returns: Top and Bottom Fractiles

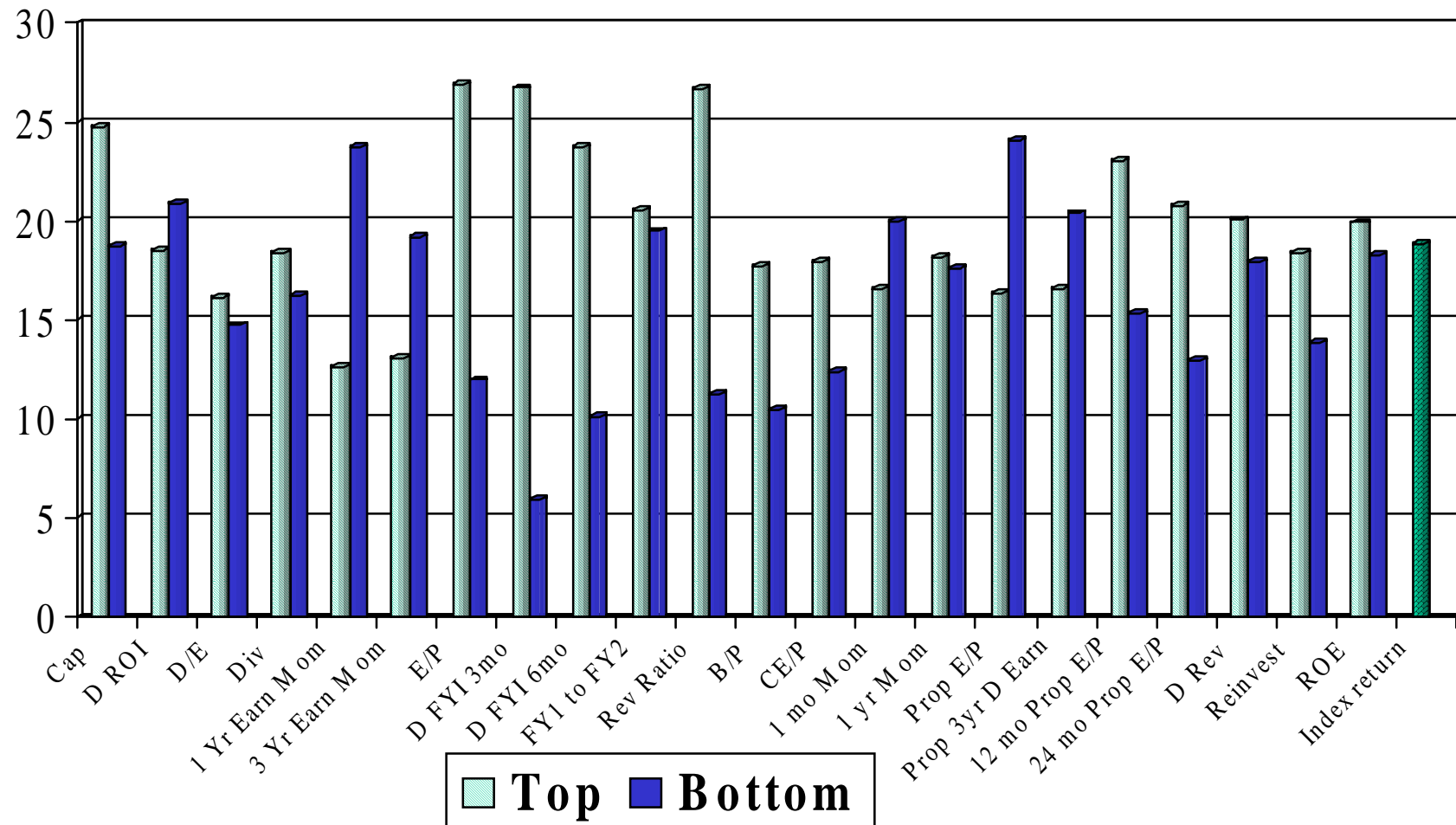


EXHIBIT 8

Percent of Periods Benchmark Outperformance

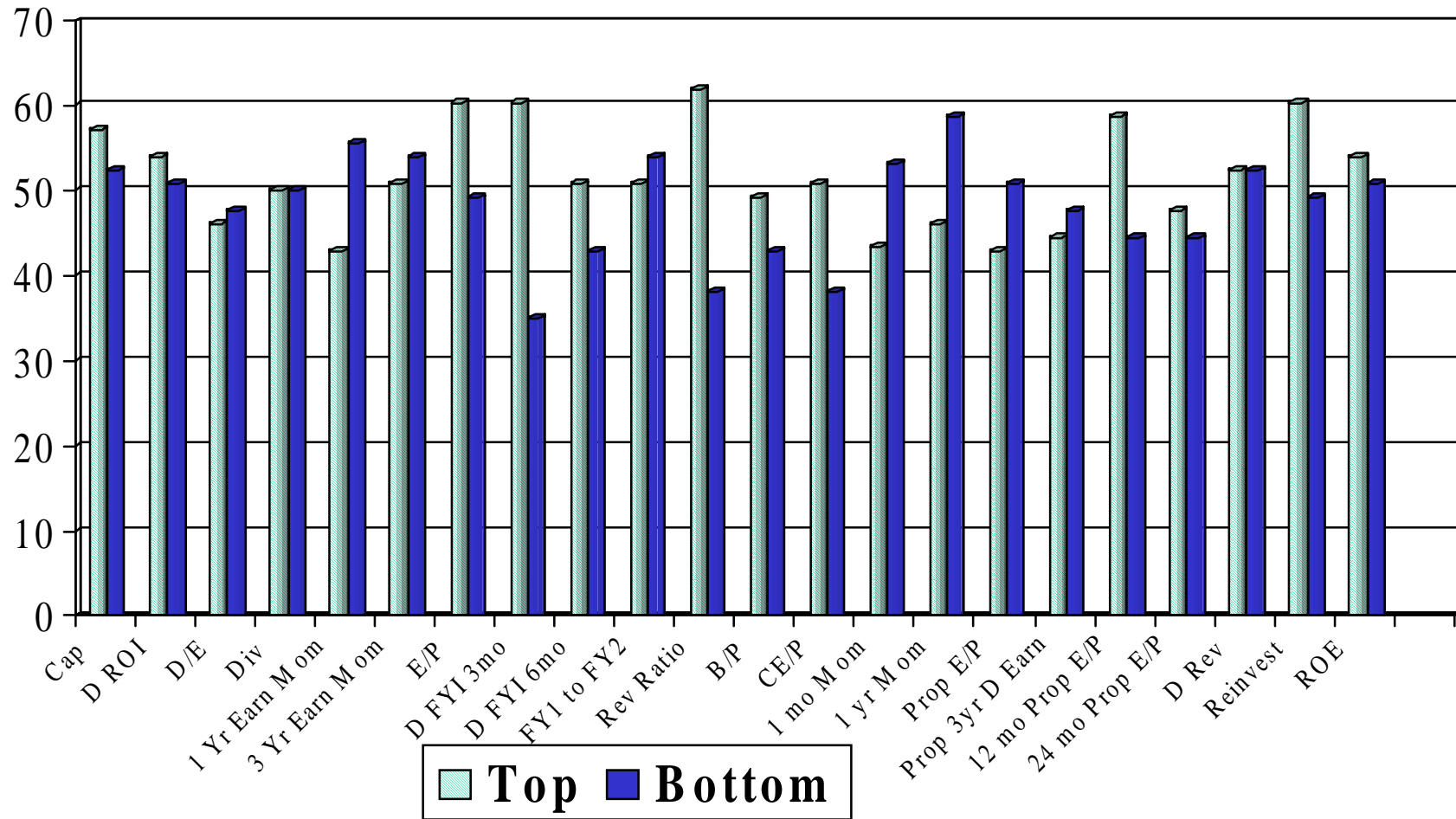


EXHIBIT 9

Change in Consensus FY1-3 Month Screen: Index=100 (each year)

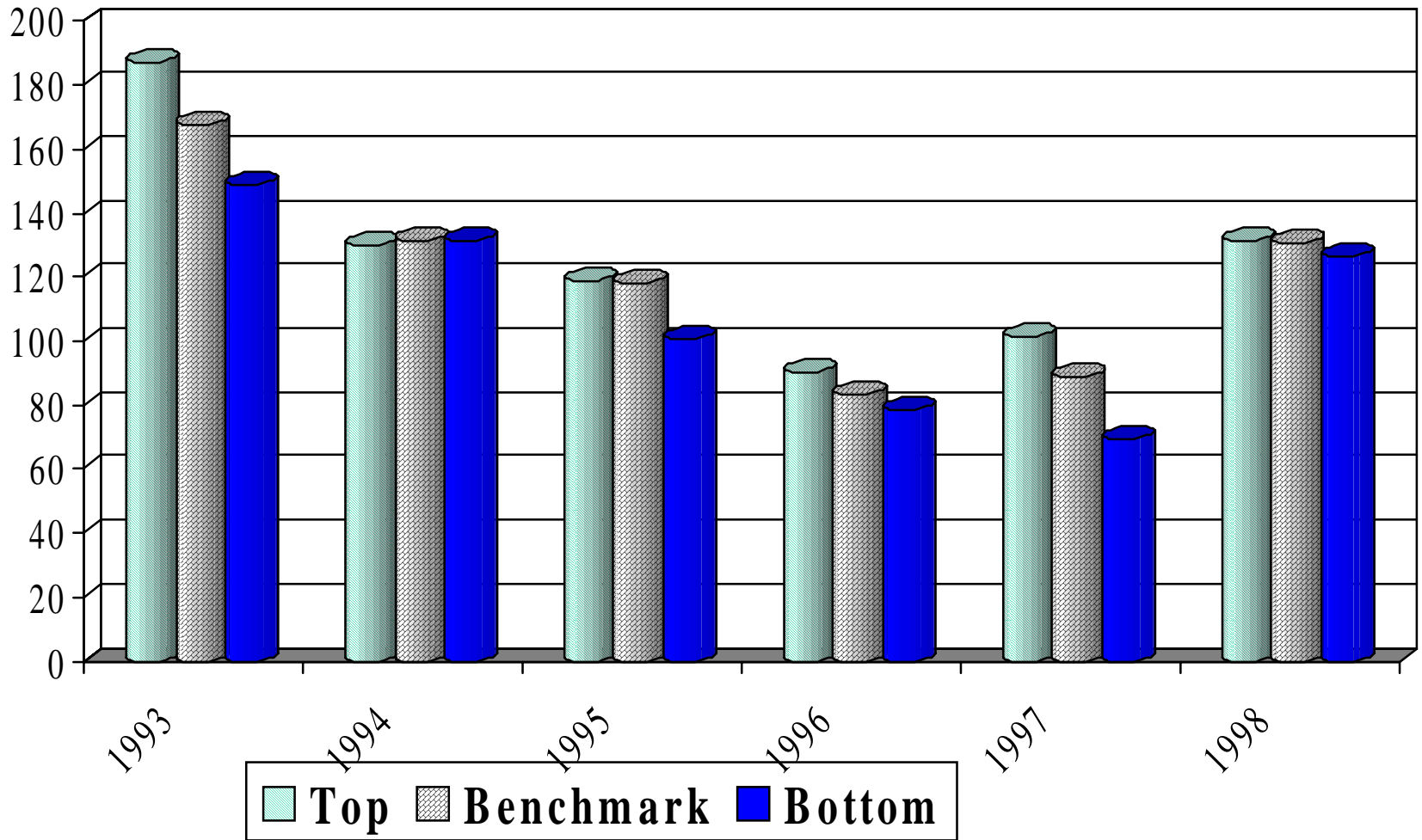


EXHIBIT 12

Performance of Scoring Screen over Different Holding Periods

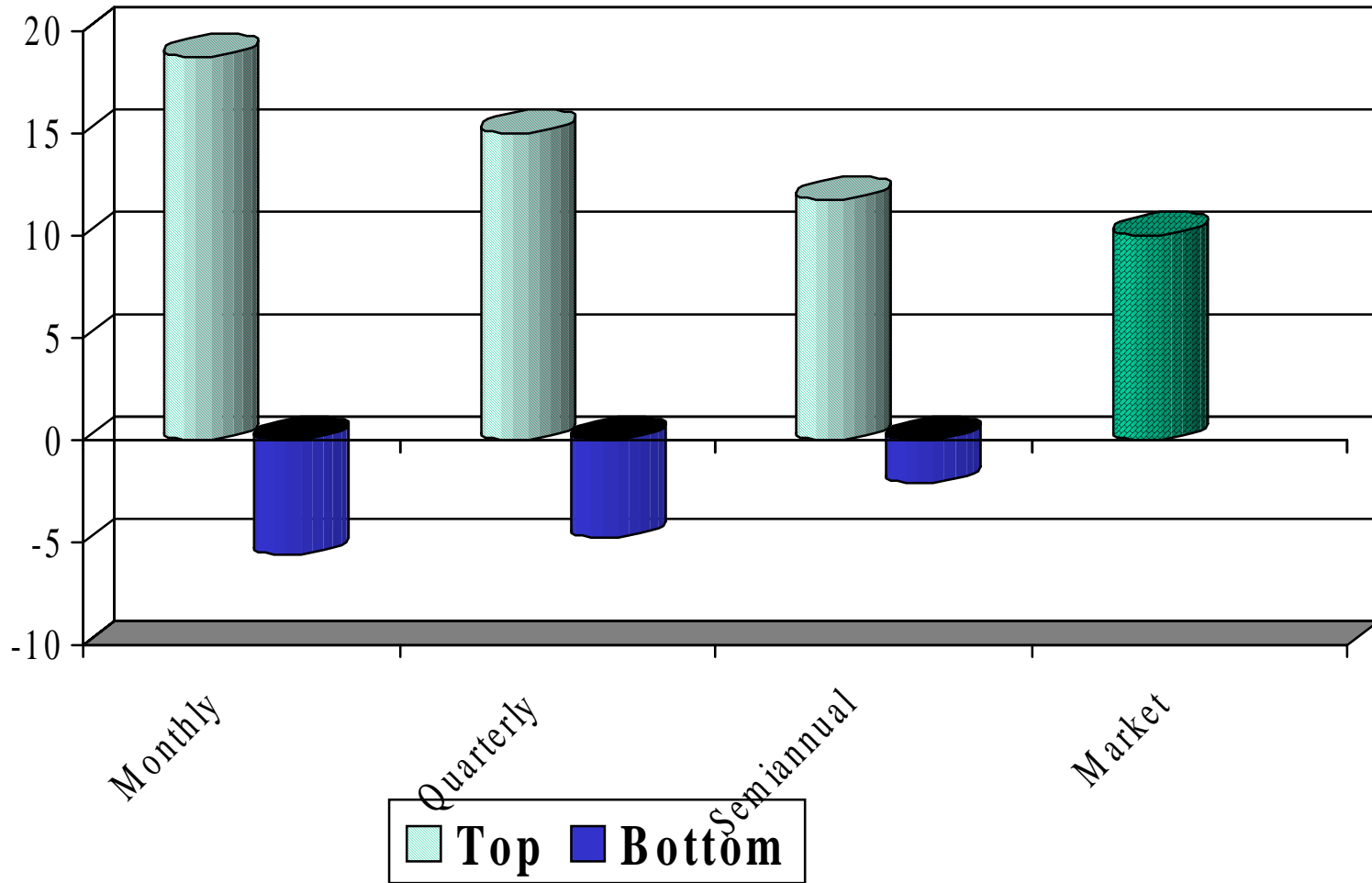


EXHIBIT 10 A

Scoring Screen Performance for South Africa	
Screen Name:	Scoring model
Sample period:	1 /93 - 5 /98
Number of observations:	65 Monthly

Performance Measure/ Summary Statistic	Note*	Portfolios - equal weighted			Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	-1-	-2-	-3-	
Annualized average return (USD)	1	24.06	10.40	-5.46	18.69	8.98	-5.58	10.05
Cumulative return (indexed at 100 - start)	2	321.54	170.91	73.77	252.97	159.32	73.27	168.02
STD Deviation of returns	3	27.44	24.89	25.69	26.50	24.33	26.28	24.74
Average annual excess return	Rm 4	14.01	0.35	-15.52	8.64	-1.07	-15.63	
	Rf 5	18.67	5.56	-9.66	13.51	4.19	-9.78	
STD Deviation of excess rtns	Rm 6	9.38	8.13	10.97	5.77	5.53	10.03	
	Rf 7	27.52	24.96	25.74	26.55	24.38	26.32	
T-stat: Average XS return Rm = 0	8	3.19	0.08	-3.15	3.24	-0.47	-3.45	
Systematic risk (Beta)	9	1.04	0.95	0.94	1.05	0.96	0.98	
Alpha	10	11.72	0.78	-14.66	7.19	-0.59	-15.17	
Co-efficient of determination	11	0.88	0.90	0.82				
Average market cap	12	8477.36	6921.67	5838.13				7079.05
% periods > Benchmark	13	66.15	43.08	38.46	66.15	44.62	30.77	
% periods > Bench up Mkt	14	67.50	32.50	30.00	72.50	37.50	27.50	
% periods > Bench Dn Mkt	15	64.00	60.00	52.00	56.00	56.00	36.00	
Max # of consecutive bmark outperformance	16	10	4	3	8	3	2	
Maximum positive excess return	17	7.04	5.16	7.82	4.72	3.86	7.94	
Maximum negative excess return	18	-8.02	-6.29	-8.49	-3.64	-4.12	-9.72	
% periods positive returns to negative	19	195.45	132.14	91.18	150.00	103.13	85.71	
% periods of negative returns	20	33.85	43.08	52.31	40.00	49.23	53.85	38.46
Max # of consecutive negative periods	21	4	7	12	6	7	12	6
Max # of consecutive positive periods	22	10	6	7	7	5	5	8
Cumulative annual returns - (index=100 each year)	23							
<i>In sample</i> 1993		244.35	180.51	135.64	188.90	170.16	131.44	167.26
1994		154.65	133.04	138.79	137.79	125.58	126.88	131.32
1995		124.79	116.38	102.12	122.35	120.39	102.56	117.78
<i>Out of sample</i> 1996		83.52	80.91	74.86	94.06	76.97	73.54	82.94
1997		87.38	81.07	67.21	90.29	92.68	72.92	88.51
1998		93.43	93.22	76.26	93.53	86.82	79.88	88.47
Relative Performance -	24							
1993		3	2	1	3	2	1	
1994		3	1	2	3	1	2	
1995		3	2	1	3	2	1	
1996		3	2	1	3	2	1	
1997		3	2	1	2	3	1	
1998		3	2	1	3	2	1	
Average Relative Performance -		3.00	1.83	1.17	2.83	2.00	1.17	
Cumulative annual returns -	25							
Last two years		74.62	65.61	42.58	80.01	67.53	47.97	69.57
Last five years		214.98	129.25	67.95	198.30	127.41	68.33	137.90
Factor average	26	2.41	-0.46	-3.33				-0.28
Factor median	27	2.00	-0.50	-3.00				0.00
Factor standard deviation	28	1.12	0.78	1.33				2.44

*All definitions are in Exhibit 2

EXHIBIT 10 B

Scoring Screen Performance for South Africa	
Screen Name:	Scoring model
Sample period:	3 /93 - 3 /98
Number of observations:	21 Quarterly

Performance Measure/ Summary Statistic	Note*	Portfolios - equal weighted			Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	-1-	-2-	-3-	
Annualized average return (USD)	1	20.71	5.55	-4.35	14.99	8.44	-4.73	8.70
Cumulative return (indexed at 100 - start)	2	268.63	132.78	79.19	208.17	152.98	77.54	154.94
STD Deviation of returns	3	31.41	24.72	24.71	29.86	24.59	25.34	25.91
Average annual excess return	Rm 4	12.01	-3.15	-13.05	6.29	-0.26	-13.43	
	Rf 5	15.57	0.90	-8.66	10.03	3.69	-9.03	
STD Deviation of excess rtns	Rm 6	10.42	7.99	9.31	6.73	5.13	7.86	
	Rf 7	31.63	24.92	24.90	29.99	24.77	25.52	
T-stat: Average XS return Rm = 0	8	2.68	-0.94	-3.22	2.68	-0.94	-3.22	
Systematic risk (Beta)	9	1.15	0.91	0.89	1.13	0.93	0.93	
Alpha	10	9.55	-2.21	-11.92	4.69	0.34	-12.67	
Co-efficient of determination	11	0.91	0.91	0.87				
Average market cap	12	8754.16	6995.01	5780.97				7176.71
% periods > Benchmark	13	71.43	52.38	28.57	57.14	42.86	19.05	
% periods > Bench up Mkt	14	69.23	53.85	30.77	53.85	53.85	23.08	
% periods > Bench Dn Mkt	15	75.00	50.00	25.00	62.50	25.00	12.50	
Max # of consecutive bmark outperformance	16	8	4	4	7	4	1	
Maximum positive excess return	17	19.78	5.02	4.29	9.67	5.43	3.99	
Maximum negative excess return	18	-6.55	-10.73	-11.36	-3.37	-7.32	-11.20	
% periods positive returns to negative	19	200.00	162.50	90.91	200.00	162.50	75.00	
% periods of negative returns	20	33.33	38.10	52.38	33.33	38.10	57.14	38.10
Max # of consecutive negative periods	21	3	3	4	3	4	5	4
Max # of consecutive positive periods	22	8	8	3	8	7	3	7
Cumulative annual returns - (index=100 each year)	23							
<i>In sample</i> 1993		214.47	157.27	132.87	164.39	155.14	136.39	154.24
1994		142.40	138.14	145.54	126.97	134.16	135.51	131.32
1995		128.06	116.89	98.24	123.31	124.52	94.96	117.78
<hr/> <i>Out of sample</i> 1996		85.71	80.56	70.79	95.02	78.56	67.77	82.94
1997		84.96	77.00	74.33	88.79	92.57	77.72	88.51
1998		94.32	84.29	79.22	95.86	81.17	83.88	88.47
Relative Performance -	24							
1993		3	2	1	3	2	1	
1994		2	1	3	1	2	3	
1995		3	2	1	2	3	1	
1996		3	2	1	3	2	1	
1997		3	2	1	2	3	1	
1998		3	2	1	3	1	2	
Average Relative Performance -		2.83	1.83	1.33	2.33	2.17	1.50	
Cumulative annual returns -	25							
Last two years		72.20	55.77	49.50	79.27	64.50	54.59	69.57
Last five years		203.30	115.99	74.01	185.85	136.19	71.72	137.90
Factor average	26	2.49	-0.44	-3.34				-0.27
Factor median	27	2.50	-0.50	-3.00				0.00
Factor standard deviation	28	1.12	0.80	1.31				2.45

*All definitions are in Exhibit 2

EXHIBIT 10 C

Scoring Screen Performance for South Africa	
Screen Name:	Scoring model
Sample period:	6 /93 - 12/98
Number of observations:	10 Semi-annual

Performance Measure/ Summary Statistic	Note*	Portfolios - equal weighted			Portfolios - value weighted			Market portfolio
		-1-	-2-	-3-	-1-	-2-	-3-	
Annualized average return (USD)	1	12.88	3.63	-2.45	11.76	4.61	-2.11	6.64
Cumulative return (indexed at 100 - start)	2	183.23	119.51	88.35	174.37	125.25	89.90	137.90
STD Deviation of returns	3	31.17	25.29	29.32	27.19	26.41	26.77	25.64
Average annual excess return	Rm 4	6.24	-3.01	-9.08	5.12	-2.03	-8.75	
	Rf 5	8.03	-1.02	-6.95	6.94	-0.06	-6.62	
STD Deviation of excess rtns	Rm 6	8.74	7.57	9.84	6.26	5.45	5.93	
	Rf 7	31.51	25.65	29.70	27.45	26.72	27.13	
T-stat: Average XS return Rm = 0	8	1.86	-0.89	-1.80	1.89	-0.70	-3.13	
Systematic risk (Beta)	9	1.18	0.94	1.08	1.03	1.01	1.02	
Alpha	10	4.77	-2.56	-9.52	4.69	-2.03	-8.77	
Co-efficient of determination	11	0.94	0.91	0.89				
Average market cap	12	8783.44	7173.67	6120.64				7359.25
% periods > Benchmark	13	80.00	40.00	30.00	70.00	50.00	10.00	
% periods > Bench up Mkt	14	83.33	33.33	50.00	66.67	66.67	16.67	
% periods > Bench Dn Mkt	15	75.00	50.00	0.00	75.00	25.00	0.00	
Max # of consecutive bmark outperformance	16	5	2	2	5	4	1	
Maximum positive excess return	17	18.27	5.88	9.83	8.00	4.04	2.26	
Maximum negative excess return	18	-5.33	-12.42	-15.04	-3.89	-8.00	-11.67	
% periods positive returns to negative	19	150.00	150.00	100.00	150.00	150.00	100.00	
% periods of negative returns	20	40.00	40.00	50.00	40.00	40.00	50.00	40.00
Max # of consecutive negative periods	21	2	2	2	2	2	2	2
Max # of consecutive positive periods	22	5	5	3	4	5	3	5
Cumulative annual returns - (index=100 each year)	23							
<i>In sample</i> 1993		155.55	134.05	133.94	143.95	133.13	134.34	137.28
1994		136.80	141.04	148.13	125.45	139.24	134.12	131.32
1995		123.02	114.72	108.86	120.20	123.45	106.78	117.78
<i>Out of sample</i> 1996		83.75	82.21	72.16	93.17	78.87	72.55	82.94
1997		85.79	83.98	72.96	89.38	86.25	77.94	88.51
1998		97.43	79.81	77.71	96.47	80.47	82.63	88.47
Relative Performance -	24							
1993		3	2	1	3	1	2	
1994		1	2	3	1	3	2	
1995		3	2	1	2	3	1	
1996		3	2	1	3	2	1	
1997		3	2	1	3	2	1	
1998		3	2	1	3	1	2	
Average Relative Performance -		2.67	2.00	1.33	2.50	2.00	1.50	
Cumulative annual returns -	25							
Last two years		74.42	58.67	47.90	79.47	60.51	55.27	69.57
Last five years		183.23	119.51	88.35	174.37	125.25	89.90	137.90
Factor average	26	2.48	-0.40	-3.35				-0.29
Factor median	27	2.50	-0.50	-3.00				0.00
Factor standard deviation	28	1.08	0.75	1.37				2.46

*All definitions are in Exhibit 2

EXHIBIT 11**Factor performance summary - South Africa**

Sample Period	Number of observations	Average Annualised Return		Return Spread	Annualised Excess Returns		Std Deviation of Annualised Returns		Std Deviation of Top/Bottom spread returns	% Periods Benchmark Outperformance		
		Top	Bottom	Top/Bottom	Top	Bottom	Top	Bottom	Top	Bottom		
Scoring Model - Monthly observations	1 /93 - 5 /98	65	18.69	-5.58	24.27	8.64	-15.63	26.50	26.28	14.45	66.15	30.77
Scoring Model - Quarterly observations	3 /93 - 3 /98	21	14.99	-4.73	19.72	6.29	-13.43	29.86	25.34	13.60	57.14	19.05
Scoring Model - Semi annual observations	6 /93 - 12/98	10	11.76	-2.11	13.87	5.12	-8.75	27.19	26.77	11.97	70.00	10.00

EXHIBIT 13

Scoring Screen Percent of Periods Benchmark Outperformance

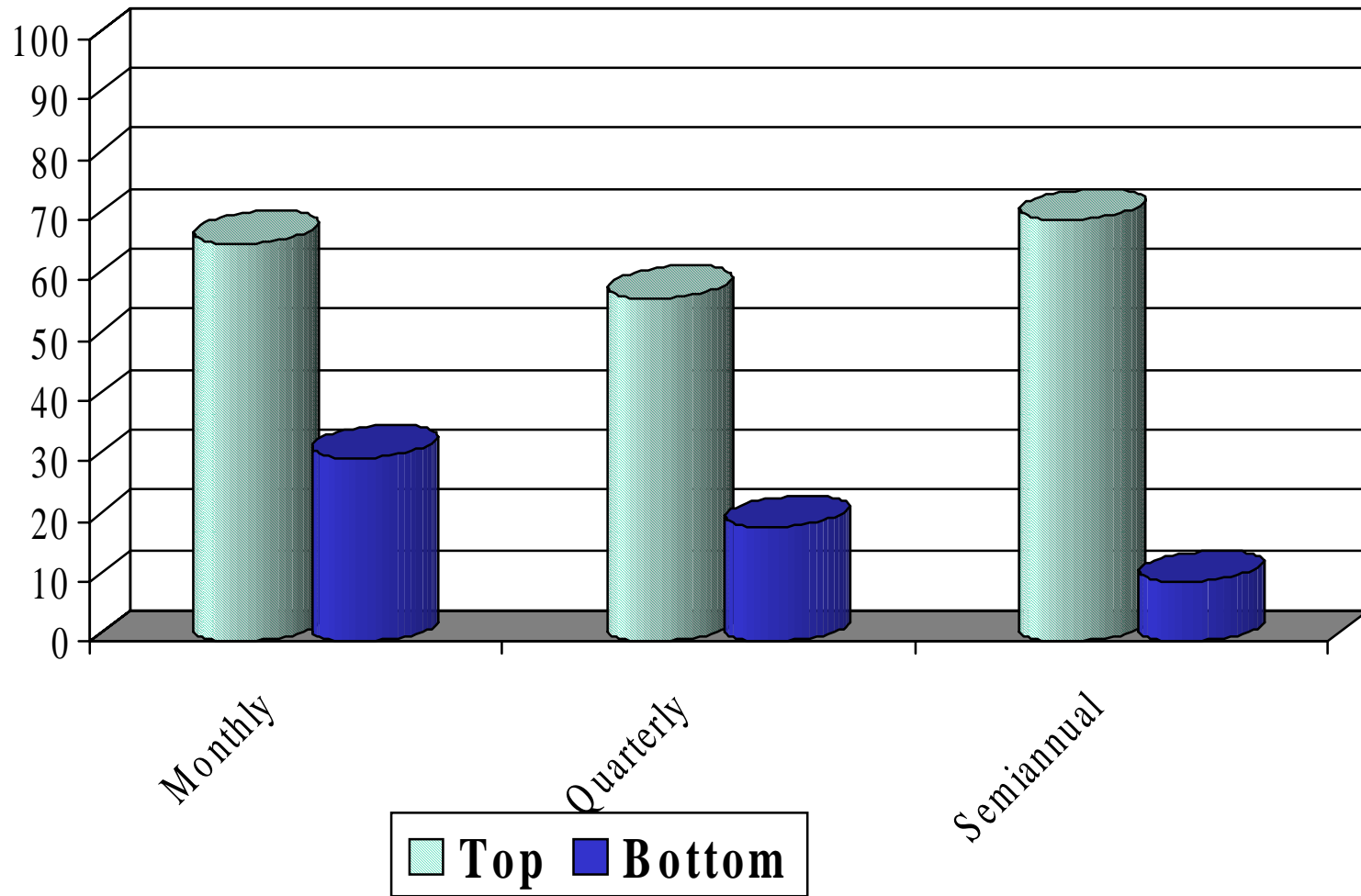


EXHIBIT 14

Year by Year Scoring Screen Performance

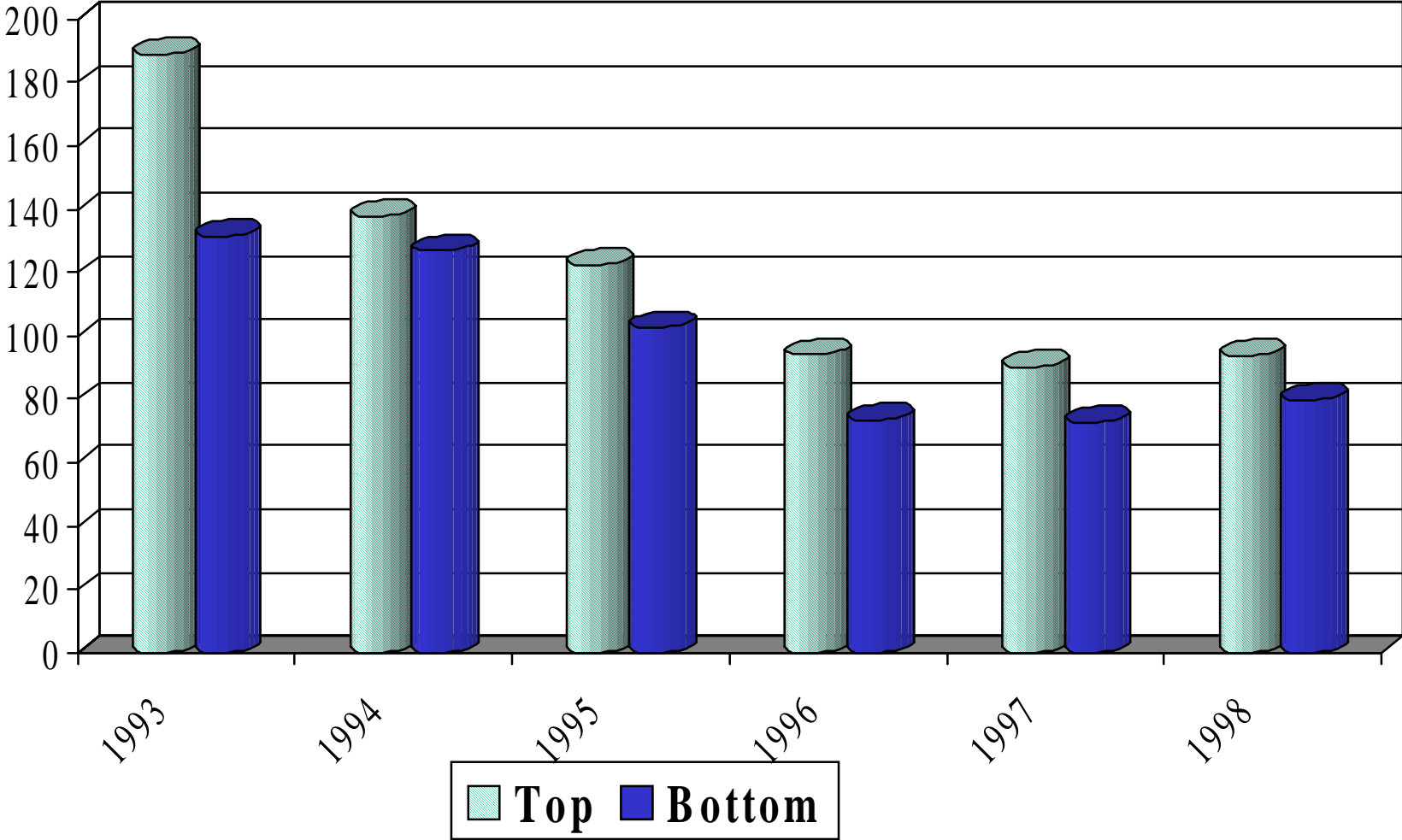


EXHIBIT 15

Value of US\$100 Investment in Scoring Screen Portfolios

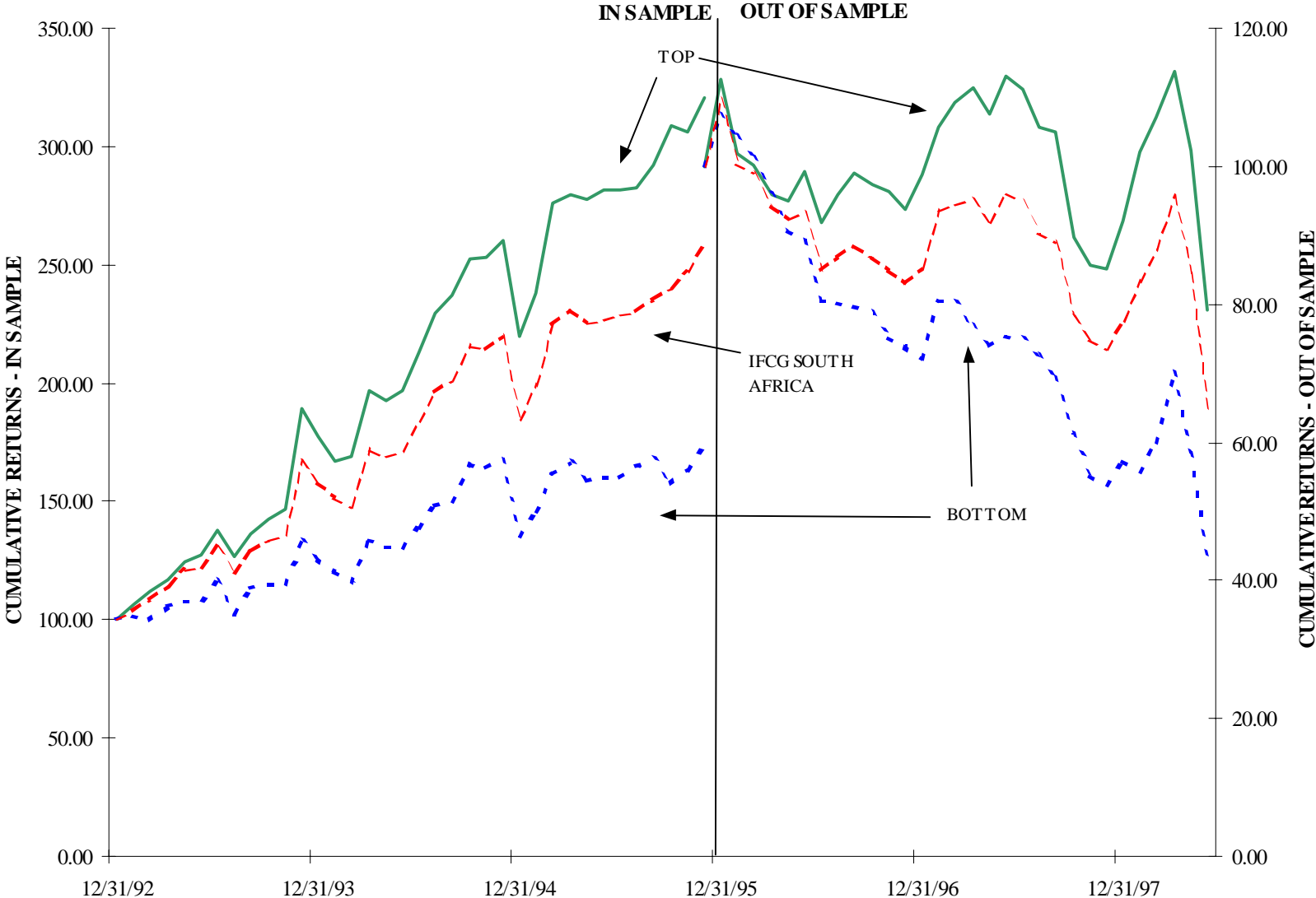


EXHIBIT 16

Analysis of Scoring Screen Performance by Market Capitalization

