P van Rensburg* and M Robertson

Size, price-to-earnings and beta on the JSE Securities Exchange

1. INTRODUCTION

"... the main implication of the CAPM is that in market equilibrium, the value weighted market portfolio, M, is mean-variance efficient. The mean-variance efficiency of M, in turn, says that:

(i) β, the slope in the regression of a security's return on the market return, is the only risk needed to explain expected return;

(ii) *There is a positive premium for β risk.*

... evidence of (ii) ... is only support for the CAPM if (i) also holds" (Fama and French, 1996:1948).

For several decades the Capital Asset Pricing Model (CAPM) has played an important role in financial economics. Accredited to Sharpe (1964), Lintner (1965), Mossin (1966) and Black (1972), the model embodies a theory of what can be inferred about expected returns when markets are in equilibrium, homogenous expectations prevail and when all investors pursue a mean-variance optimising objective. Attempts to empirically verify the predictions of the CAPM, however, have produced numerous inconsistencies with the theory. Most notable is the evidence that other variables such as book-to-market ratios, market capitalisation, price-to-earnings ratios and leverage are able to predict security returns beyond that explained by the risk factor beta. In the previous issue of this journal, van Rensburg and Robertson (2003) apply a cross-sectional regression methodology on 24 candidate style variables. A two factor style-based model of JSE returns is derived with size and price-to-earnings subsuming the influence of the other factors. It is on the basis of these findings that the size and price-to-earnings variables are selected for more detailed examination in this study. In particular, following Fama and French (1992), the relationship between these effects and the explanatory power of beta is investigated.

The remainder of the article is set out as follows. Section 2 gives an overview of the relevant prior literature. Section 3 introduces the data sets and describes the methodology. Section 4 presents the results and section 5 summarises and concludes.

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2. LITERATURE REVEIW

The small size effect documented by Banz (1981) is among the first observed empirical contradictions of the CAPM[1]. Using the total market value of listed equity as an indicator of firm size, Banz (1981) forms twenty-five test portfolios from two-way quintile sorts on size and market beta. The results of the two-way sorts show that the average returns of small capitalisation stocks are too high to be explained by their beta estimates and *vice versa*. Around the same time, Basu (1977, 1983) reports that both earnings-to-price and firm size are significant factors in determining average returns among US listed firms. He also shows that market beta is positively related to stock returns, thereby supporting prediction (i) as presented in the Fama and French (1996) quotation at the inception of this article but not prediction (ii). Basu (1983) argues that the size effect is a proxy for his earnings-to-price effect thereby implying that the Banz (1981) model is incorrectly specified.

In a widely acclaimed paper, Fama and French (1992) evaluate the role of beta in the presence of the CAPM anomalies associated with the size, leverage, book-to-market and earnings-to-price attributes. Conducting two-way portfolio sorting procedures on a US sample, their results reveal that when there is variation in market beta that is unrelated to size, there is no longer a relationship between market beta and average return i.e. the positive relationship between beta and returns is, in reality, the size effect in disguise. The positive relationship observed between book-to-market ratios and average returns does not appear to be explained by beta either. The results lead Fama and French (1992:428) to a two factor style-based model of expected returns implications that is not consistent with the CAPM: *"Our bottom-line results are: (a) beta does not seem to help explain the cross-section of average stock returns, and (b) the combination of size and book-to-market equity seems to absorb the roles of leverage and E/P in average stock returns, at least during our 1963-1990 sample period. If assets are priced rationally, our results suggest that stock risks are multidimensional".*

The evidence on the role of firm size on the JSE Securities Exchange (JSE) is mixed. De Villiers, Lowlings, Pettit and Affleck-Graves (1986), Bradfield, Barr and Affleck-Graves (1988) and Page and Palmer (1993) find no evidence of a small size effect. Page (1996) compares the performance of the Black (1972) version of the CAPM with a three and five factor version

[1]Note that in all of the empirical work discussed in this paper a market index is taken as an observable proxy for the 'market portfolio' that plays an important theoretical role in the CAPM.

of the APT in explaining the earnings-to-price and size anomalies. The results show that the earnings-to-price effect persists across different benchmarks and is robust to risk-adjustment of up to five APT factors. Again, no significant small size effect is observed. Using a portfolio sorting methodology, van Rensburg (2001) documents the outperformance of small capitalisation stocks that persists after risk adjustment using both the CAPM and the two factor APT model of van Rensburg and Slaney (1997).

One of the primary reasons for the non-identification of a size effect in the earlier South African research is due to the small sample sizes used in this work. As an illustration of the effect that this can have, consider the US findings of Davis (1994) who, when obtaining data from Moody's Industrial Manuals to avoid the problem of survivorship bias, restricts his sample to 100 firms in the top half of the CRSP size ranking. In contrast to other US studies, he finds no size effect and attributes this to the fact that small firms have been excluded from the sample. Smaller firms have routinely been excluded from prior South African studies due to thin trading concerns. However, over the more recent past the liquidity of the JSE has increased considerably and, for example, it has more than doubled after the introduction of the JET system in 1996. As a result, more recent work is able to use more representative samples than the early South African research.

3. DATA AND METHODOLOGY

The BARRA organisation's full data set of monthly stock returns from July 1990 to June 2000, adjusted for all capital events (including delistings) and dividends, was generously supplied for use in this study. Note that, by including stocks that delisted over the sample period, an explicit effort is made to avoid survivorship bias. Cash shell companies are excluded from the sample. A thin trading filter is also applied to remove stocks from the sample in each month where the average monthly trading volume is less than 0.01% of the ordinary shares in issue on the last day of the previous month. This ensures that the remaining stocks in each month traded at least once during the month.

At each month-end the price-to-earnings ratio and total market capitalisation of all JSE listed stocks is extracted from the McGregor's/ Bureau of Financial Analysis (McG/BFA). The earnings data is lagged between 5 and 17 months, depending on each firm's financial year-end, to conservatively ensure this information is publicly available at the time when the ensuing rankings are conducted. To facilitate ranking, only shares with positive price-to-earnings ratios are included in the sample. Taking consideration of the financial-industrial and resource dichotomy on the JSE, the empirical work in this study is conducted first using a sample of all stocks and then repeated using a sample of financial-industrial (Findi) stocks. The smaller number of stocks in the resource sector, makes a direct examination of this sector unfeasible using the portfolio sorting methodology to be described below.

In addition to the size and price-to-earnings attributes, a monthly *pre-ranking* beta attribute is estimated for all stocks remaining in the sample. The pre-ranking beta is the slope coefficient estimated from an OLS time series regression of the returns of each stock on a market proxy using information available up to that time[2]. The market proxies are taken as the JSE All Share Index and JSE Financial and Industrial Index for the all stocks and Findi samples respectively. Similar to Fama and French (1992), the pre-ranking beta estimates are calculated on a rolling-window basis using an increasing history of between twelve months, using return data lagging July 1990, and thirty months from January 1992 onwards.

The methodology employed in this study adopts both a one-way and two-way sorting procedure to create simulated portfolios. For the one-way sort procedure, stocks are ranked each month in descending order of the attribute under consideration. Quintile breakpoints are then inserted in the ranking, allowing all stocks to be assigned to one of five groups. Using the stocks in each quintile at the end of each month, an equal-weighted portfolio is constructed and rolled forward to the end of the following month. In this way, a time series of monthly returns is generated for each of the five portfolios. Transaction costs are not accounted for in this procedure. An aggregate *post-ranking* beta is then calculated for each simulated portfolio.

A two-way sort procedure allows two attributes to be examined concurrently. Stocks are first sorted in each month into quintiles by ranking on the first attribute under consideration, as described above. Then, within each quintile, stocks are ranked in descending order of the second attribute being investigated thereby creating twenty-five groups of stocks. This creates independent variation in each of the attributes, allowing the influence of one attribute to be examined while holding the other constant. As with the one-way sort procedure, a post-ranking beta is then estimated for each of the twenty-five simulated portfolios[3]. Conducting two-way stock sorting procedures discussed above require a sample large enough to create diversified portfolios with cross-sectional variation in the first attribute that is unrelated to the second. Table 1 shows the year-on-year average number of non-thinly traded stocks in the monthly one-way and two-way sorted portfolios.

The average number of stocks in the second sort portfolios varies between seven and sixteen for the all

[2]The term pre-ranking beta differentiates this beta from the post-ranking beta introduced later in the paper.

[3]The monthly data sorting, beta estimation and portfolio simulations in this paper are conducted using Minitab v13.1 statistical software and required more than 110 000 lines of instruction code.

stocks sample in Panel A and between six and fifteen for the Findi stock sample in Panel B. This is roughly comparable to the number of stocks in the Fama and French (1992) two-way sort portfolios where the average number of stocks per month in the largest seven size *deciles* of the size-beta sorted portfolios is between fifteen and forty-one. While Fama and French (1992) reconstitute their portfolios annually on the anniversary of the first formation date, the simulated portfolios created in this study are reconstituted *monthly*. This ensures that only the most up-to-date information is being used in the construction of the portfolios thereby reducing the chance of any information being lost. In a preliminary investigation, the return of portfolios reconstituted at quarterly and six-monthly intervals were not meaningfully different from those reconstituted at monthly intervals. This is also supported by other JSE results reported in Graham and Uliana (2001:16) who investigated the market-to-book effect: *"...portfolios formed less often than each year shows no clear evidence of superior value performance over the ten year period"*.

Table 1: Average number of traded stocks in the universe portfolio, first sort portfolio and second sort portfolio for all stocks and for Findi stocks.

Panel A: All stocks											
Years	**All**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Universe	268	180	176	185	224	246	276	297	328	364	408
First sort	54	36	35	37	45	49	55	59	66	73	82
Second sort	11	7	7	7	9	10	11	12	13	15	16

Panel B: Findi stocks											
Years	**All**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Universe	234	152	150	158	194	214	240	259	287	325	365
First sort	47	30	30	32	39	43	48	52	57	65	73
Second sort	9	6	6	6	8	9	10	10	11	13	15

Portrayed are the mean number of stocks in the universe portfolio, the first sort portfolios and the second sort portfolios for all months from July 1990 to June 2000 and, thereafter, for twelve-month sub-periods.

Finally, it is acknowledged that the ten year sample period examined in this study should ideally be longer but has been constrained due to the difficulty of data collection. Future researchers who wish to replicate this analysis over a longer time period should be particularly alert to the possibility of survivorship bias influencing their sample selection.

4. EMPIRICAL RESULTS

In a preliminary test to assess the interaction between the explanatory variables and pre-ranking betas, the cross-sectional correlation between the size and price-to-earnings attributes and pre-ranking betas is calculated in each month from July 1990 to June 2000. Table 2 reports the mean value of the correlation coefficients over the full period and for each of the ten twelve-month sub-periods.

Contrary to the findings of Fama and French (1992), the results in Panel A show that the size attribute on the JSE is significantly positively correlated to pre-ranking beta for both samples. For the all stocks sample, the full period monthly average correlation is significantly positive while six of the sub-periods also show significant positive correlations. For the Findi sample, the average correlation is stronger over the full period and is significant in eight of the ten sub-periods. One reason for this phenomenon may be that there are some thin-trading effects remaining in the data set and this results in the smaller and, most likely, less traded securities having downwardly biased beta estimates (see Scholes and Williams, 1977, Dimson, 1979 and Bradfield, 1989 *inter alia*). It is also suggested that there may also be a 'double counting' effect due to the concentration of large stocks in the capitalisation-weighted market indices. (To illustrate the magnitude of this concentration: the top five securities comprised 50% of the market capitalization of the JSE in January 2002). Whether the negative relationship between size and beta persists after adjustments of this sort have been conducted is a topic of research outside the scope of this paper. Suffice to say that these adjustments would have to be extraordinarily powerful to *reverse* the negative relationship observed in this study (as would be consistent with the CAPM) and that most of the findings in the remainder of this study would not be affected by any adjustments of this nature.

Table 2: Average cross-sectional correlations of the size, price-to-earnings and pre-ranking beta attributes.

Panel A: Size and pre-ranking beta											
Years	**All**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
All stocks	**0,19**	**0,20**	**0,31**	**0,26**	0,09	0,07	0,11	**0,20**	**0,23**	0,15	**0,31**
Findi stocks	**0,29**	**0,31**	**0,38**	**0,40**	**0,37**	**0,33**	**0,28**	**0,25**	**0,19**	0,16	0,17

Panel B: Price-to-earnings and pre-ranking beta											
Years	**All**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
All stocks	-0,01	0,09	0,04	0,02	0,01	0,01	0,00	0,01	-0,04	-0,13	-0,08
Findi stocks	0,02	0,08	0,02	0,06	0,03	0,01	0,11	0,07	-0,06	-0,09	-0,06

Panel C: Size and price-to-earnings											
Years	**All**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
All stocks	0,09	**0,18**	0,12	0,06	0,08	0,11	0,05	0,03	0,05	-0,01	0,04
Findi stocks	0,07	0,15	0,12	0,09	0,08	0,12	0,05	0,04	0,06	-0,01	0,03

Portrayed are the mean cross-sectional correlation over the all months from July 1990 to June 2000 and for twelve-month sub-periods. Bold indicates where the p-value of the Pearson product correlation coefficient is less than 0.05 (p-values are not shown in the table).

It can be analytically demonstrated that the market capitalization weighted betas of the securities measured with respect to a market weighted index such as the ALSI must sum to unity. Note that the concentration of the market indices, together with the lower betas observed on smaller stocks is key to explaining why the (equally weighted) mean value of betas across the market is less than one.

The price-to-earnings attribute is not significantly correlated with beta in either sample as portrayed in Panel B. There is evidence of a statistically insignificant positive cross-sectional correlation between the size and price-to-earnings attributes, as shown in Panel C. By way of comparison, Page (1993:6-14) makes an observation that is, perhaps, slightly dissimilar but not in stark contrast to this result: *"...there does not appear to be any consistent correlation between size and the E/P ratio for the South African data".*

4.1 One-way quintile portfolio sorts on size, price-to-earnings and beta

Table 3 shows average returns and associated post-ranking betas (in parentheses) from July 1990 to June 2000 for one-way quintile sorted portfolios created by ranking JSE stocks in each month by the size, price-to-earnings and pre-ranking beta characteristics. Again, the results are reported for both the all stocks sample and the Findi stock sample.

For the size sorted quintile portfolios in the all stocks sample in Panel A, the spread in average return between the smallest quintile sorted portfolio and the largest quintile sorted portfolio is 2,50% per month with a t-statistic of 4,05. For the Findi sample in Panel B, the return differential is of a similar magnitude with the quintile sorted portfolio of smallest shares outperforming that of the largest with a spread of 2,56% and t-statistic of 3,86. The exception is the second quintile that posts a higher return than the third quintile. Note that due to the fact that throughout the analysis equally-weighted portfolios are being constructed, the return differentials will tend to be more extreme than that observed when the more familiar approach of capitalisation-weighted returns are examined.

The evidence that smaller firms earn a premium over larger firms is consistent with the majority of international evidence. However, in direct contrast with the international findings, the post-ranking betas of the simulated portfolios increase monotonically as the size quintiles get *larger* in both samples. This is consistent with the findings reported in table 1 and is illustrated by a graphical depiction of post-ranking beta overlaid on the average return of the size sorted quintile portfolios, shown in Figure 1.

In conformity with prior research, the results in Table 3 show that 'value' (low price-to-earnings) stocks on average outperform their more highly-rated counterparts. The spread of average returns between the lowest and the highest price-to-earnings quintiles is of similar magnitude for the Findi sample at 3,50%, with a t-statistic of 6,58, and for the all stocks sample at 3,34%, with a t-statistic of 7,38. Note that compared to the spread of average returns between the extreme size sorted quintile portfolios, the spread between the extreme price-to-earnings sorted quintile portfolios is markedly wider for both the all stock and the Findi samples. Table 3 further reveals that post-ranking betas exhibit a positive monotonic relationship with the price-to-earnings sorted quintiles in both the all stocks and Findi samples. This further contradiction of the CAPM's predictions is illustrated graphically for the all stocks and Findi samples in Figure 2.

Table 3: One-way quintile portfolio sorts on the size attribute, price-to-earnings attribute and pre-ranking beta.

Panel A: All stocks	Size	Price-to-earnings	Pre-ranking beta
Quintile 1 Big/High	1,22 (1,01)	1,02 (0,90)	2,07 (0,91)
Quintile 2	1,59 (1,00)	1,16 (0,88)	1,66 (0,79)
Quintile 3	1,61 (0,88)	1,39 (0,77)	1,99 (0,73)
Quintile 4	2,57 (0,86)	2,94 (0,60)	2,16 (0,64)
Quintile 5 Small/Low	3,73 (0,69)	4,36 (0,53)	2,98 (0,61)
Quintile (5-1)	2,50 **t=4,05**	3,33 **t=7,38**	0,90 **t=2,18**

Panel B: Findi stocks	Size	Price-to-earnings	Pre-ranking beta
Quintile 1 Big/High	1,54 (0,96)	1,16 (0,86)	2,23 (0,90)
Quintile 2	2,05 (0,80)	1,54 (0,86)	1,68 (0,80)
Quintile 3	1,65 (0,74)	1,82 (0,72)	1,97 (0,66)
Quintile 4	2,54 (0,66)	2,90 (0,60)	2,97 (0,62)
Quintile 5 Small/Low	4,10 (0,50)	4,66 (0,61)	2,87 (0,59)
Quintile (5-1)	2,56 **t=3,86**	3,49 **t=6,58**	0,64 t=1,38

Returns figures, in percent, are the mean monthly return of an equally-weighted portfolio for the 120 months from July 1990 to June 2000. Transaction costs entailed in the monthly rebalancing are not accounted for. In Quintiles 1 to 5, post-ranking betas for the period are shown in parenthesis. In the last row of each panel, labeled Quintile (5-1), the return figures are the average monthly difference in return between Quintiles 5 and 1 and t is Student's t-statistic indicating whether the difference is statistically significant. Significance above the ninety-five percent confidence level is indicated in bold. Big/Small relate to the size attribute while High/Low relate to the price-to-earnings attribute and pre-ranking beta. **Figures 1, 2 and 3 show a graphical depiction.**

The final set of results reported in Table 3 are for the quintile portfolios created from monthly sorts on the pre-ranking beta estimates. It can be seen that the pre-ranking beta sorted quintile portfolios do predict the correct ordering of the post-ranking beta portfolios. It is also shown that the smallest pre-ranking beta sorted quintile portfolio for the all stocks sample earns an average return that is 0,90% larger per month, with a t-statistic of 2,18, than the largest pre-ranking beta sorted quintile portfolio. The same is true for the Findi sample although the difference in average return between the extreme quintile portfolios is less than 1% per month and the t-statistic shows no significance. The results again directly dispute the role of beta in determining the cross-section of stock returns on the JSE. Indeed, this study finds that, if anything, there is an *inverse* relationship between beta and returns!

4.2 Two-way quintile portfolio sorts on size and price-to-earnings

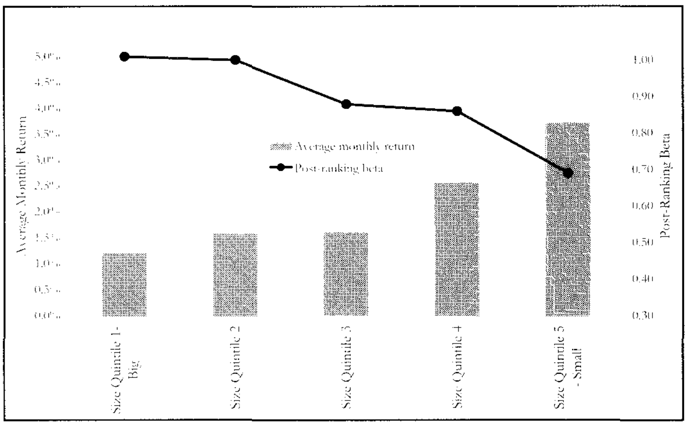
In this section, the stocks in both samples are ranked in each month based on their size attributes, assigned to quintiles and ranked again based on their price-to-earnings attributes. The mean monthly returns and post ranking betas (in parentheses) are presented for each of the portfolios in Table 4. The resulting twenty-five portfolios for each sample have cross-sectional variation in the price-to-earnings attribute that is unrelated to the size attribute within each column of Table 4.

For the all stocks sample, the highest recorded average monthly return of the twenty-five simulated portfolios is for the smallest size sorted quintile portfolio comprising the lowest price-to-earnings stocks, in the bottom-right corner of Panel A in Table 4. Conversely, the lowest recorded average monthly return of the twenty-five test portfolios is for the largest size sorted quintile portfolio comprising the highest price-to-earnings stocks, in the top-left corner of Panel A in Table 4. A broadly similar pattern emerges for the Findi stock sample.

The results in Table 4 can be graphically depicted for both samples using a return surface generated in three-dimensional space. The vertical axis of each diagram in Figure 4 represents the average return for the quintile portfolios over the period July 1990 to June 2000 and is drawn from the intersection of the size and price-to-earnings quintiles on the two horizontal axes. The edges of the return surface in each diagram represent the first and last columns and rows of the panels in Table 4.

Overall, the results support the findings of the one-way portfolio sorts on size and price-to-earnings in a two-dimensional framework. In the all stocks sample, apart from two exceptions in the third size quintile, all size sorted quintile portfolios have an average return that is higher than the portfolio on their immediate left. Three of the five quintiles horizontally and vertically have t-statistics that indicate significance above the ninety-five percent level when testing for differences in average monthly return between the largest and smallest quintiles. The difference in average monthly return in the extreme quintiles of the Findi sample is less pronounced. It can be visually inferred from the three-dimensional plane for all stocks and for Findi stocks, sloping in both cases from right to left and top to bottom, that the small size and low price-to-earnings effects operate independently on the JSE. The one effect is not merely a proxy for the other.

All Stocks (Size Sorted Quintiles



Findi Stocks (Size Sorted Quintiles)

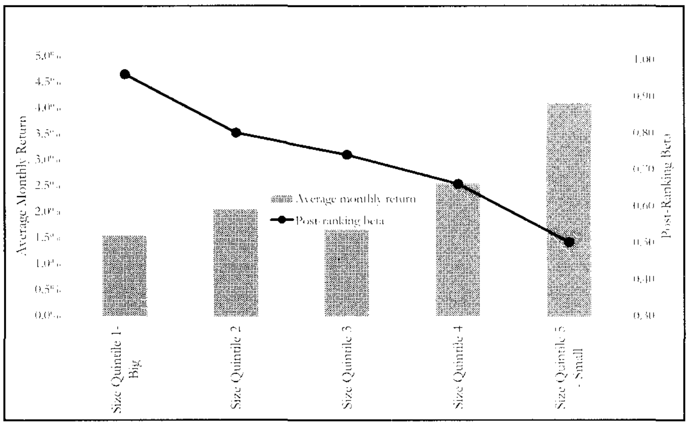
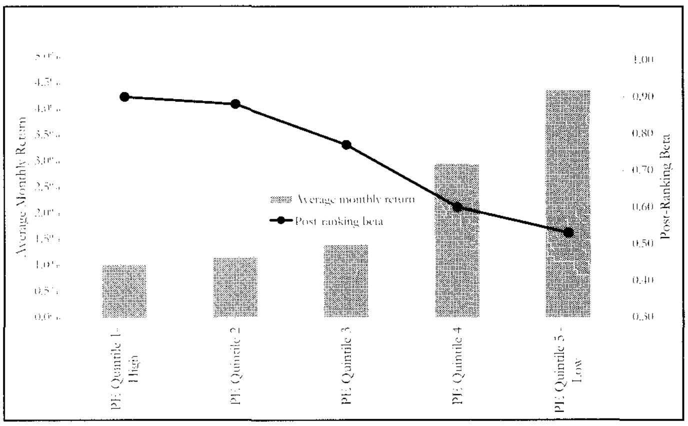


Figure 1: One-way size sorted quintile portfolio returns and post-ranking betas.

Returns figures, shown in percent by the vertical bar chart, are the average monthly return of each equally weighted size sorted quintile portfolio for the 120 months from July 1990 to June 2000. The superimposed line chart shows the post-ranking beta of each size sorted quintile portfolio relative to the JSE All Share and Financial-Industrial Indices respectively.

All Stocks (Price-to-Earnings Sorted Quintiles)



Findi Stocks (Price-to-Earnings Sorted Quintiles)

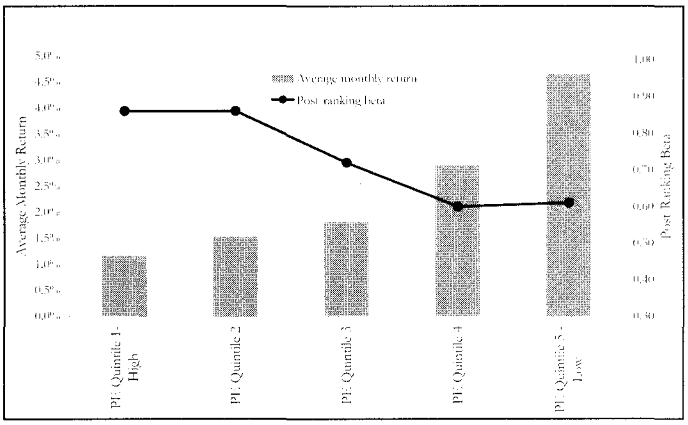


Figure 2: One-way price-to-earnings sorted quintile portfolio returns and post-ranking betas.

Returns figures, shown in percent by the vertical bar chart, are the average monthly return of each equally weighted price-to-earnings sorted quintile portfolio for the 120 months from July 1990 to June 2000. The superimposed line chart shows the post-ranking beta of each size sorted quintile portfolio relative to the JSE All Share and Financial-Industrial Indices respectively.

All Stocks (Beta Sorted Quintiles) **Findi Stocks (Beta Sorted Quintiles)**

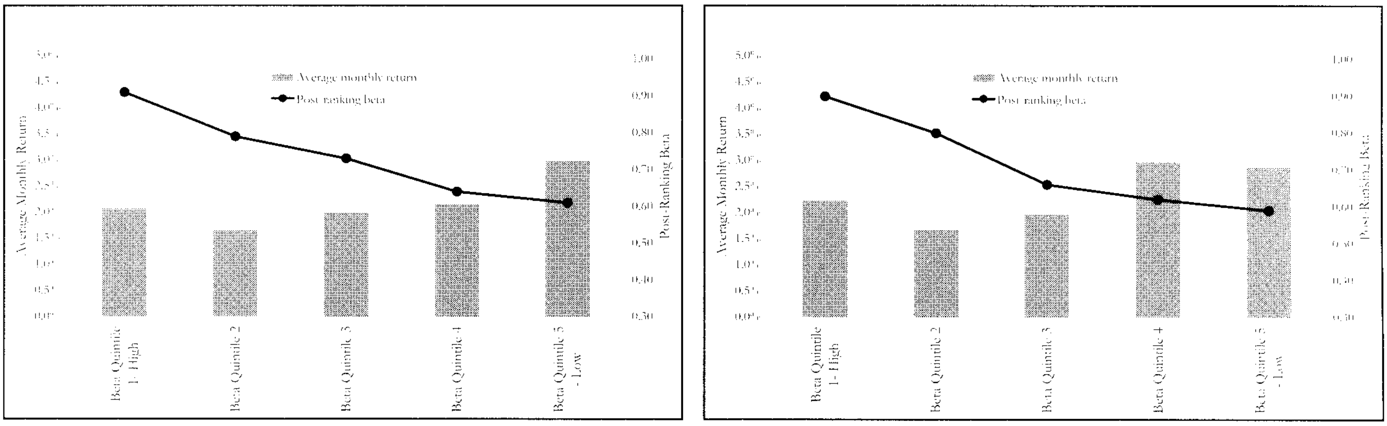
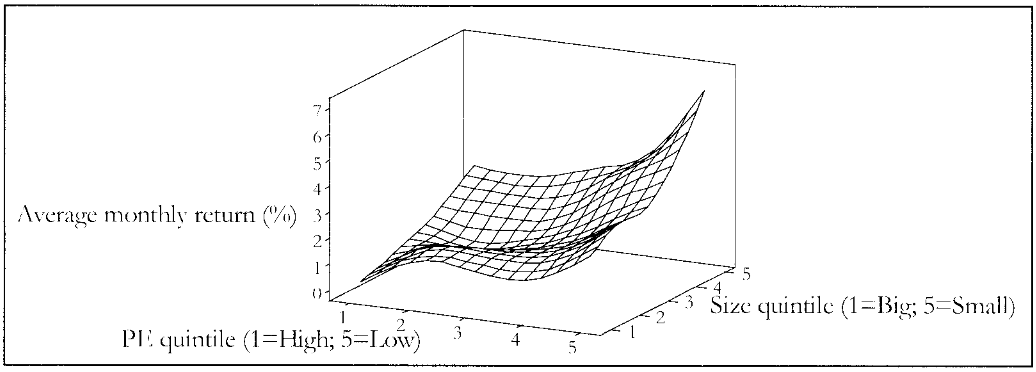


Figure 3: One-way pre-ranking beta sorted quintile portfolio returns and post-ranking betas.

Returns figures, shown in percent by the vertical bar chart, are the average monthly return of each equally weighted pre-ranking beta sorted quintile portfolio for the 120 months from July 1990 to June 2000. The superimposed line chart shows the post-ranking beta of each size sorted quintile portfolio relative to the JSE All Share and Financial-Industrial Indices respectively.

All stocks



Findi stocks

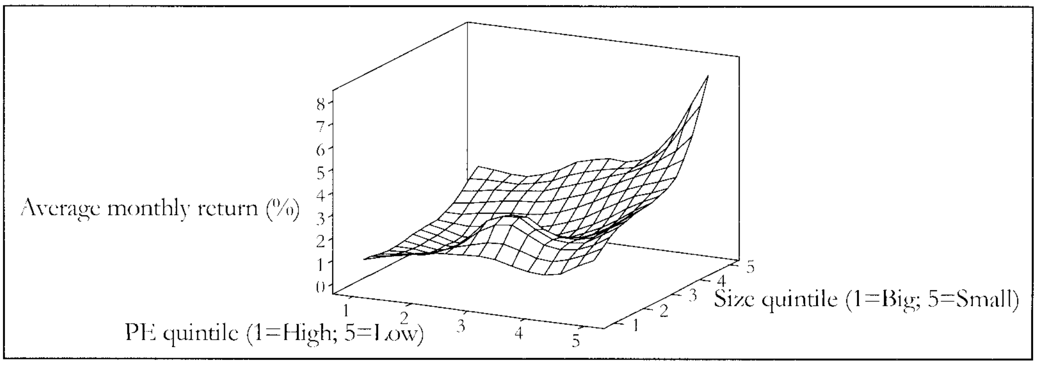


Figure 4: Average return and post-ranking betas for all stocks and Findi stocks from two-way portfolio sorts on size and price-to-earnings.

Returns figures along the vertical axis, in percent, are the average monthly return of each equally weighted size and price-to-earnings sorted portfolio of stocks for the 120 months from July 1990 to June 2000.

5. SUMMARY AND CONCLUSION

The results of the one-way size sorted quintile portfolios presented in this study bode worse for beta on the JSE compared with the international evidence. Whereas Fama and French (1992:453) conclude that the beta of their size sorted portfolios: *"...do a fine job on the relation between size and average return, but they do a lousy job on their main task, the relation between β and average return."*, the evidence presented in this study shows that small size earns a higher return on the JSE but has a *lower* beta. It is further documented that quintile portfolios containing low price-to-earnings stocks earn higher average returns and also have lower betas. Taken together with the results based on sorting by pre-ranking betas this study finds for the first time on the JSE that, if anything, beta is inversely related to returns!

When two-way simulated portfolios are created by sorting on both the size and the price-to-earnings attributes, the findings suggest that to a large extent the small size and low price-to-earnings effects operate independently of each other. This provides empirical support for at least two style-based factors being specified in a model of the cross-sections of JSE returns. The findings of this study present an unambiguous empirical contradiction of the CAPM and a challenge for future theories to interpret.

Table 4: Two-way quintile portfolio sorts on size and price-to-earnings and post-ranking beta

Panel A			**Size**			
All stocks	**Quintile 1 Big**	**Quintile 2**	**Quintile 3**	**Quintile 4**	**Quintile 5 Small**	**Quintile (5-1)**
Price-to-earnings						
Quintile 1 High	0,24 (1,00)	0,57 (0,88)	1,03 (0,86)	1,67 (0,69)	2,47 (0,41)	2,23 **t=2,55**
Quintile 2	1,30 (0.77)	1,32 (0,67)	0,68 (0,47)	1,55 (0,40)	2,35 (0,19)	1,05 t=1,26
Quintile 3	1,17 (0,84)	1,35 (0,64)	1,10 (0,58)	1,79 (0,33)	2,87 (0,24)	1,70 t=1,85
Quintile 4	1,15 (0,81)	1,67 (0,65)	1,96 (0,66)	3,19 (0,47)	3,73 (0,20)	2,58 **t=3,03**
Quintile 5 Low	2,32 (0,85)	3,02 (0,61)	3,13 (0,62)	4,45 (0,38)	6,46 (0,23)	4,13 **t=3,81**
Quintile (5-1)	2,08 t=1,78	2,46 **t=2,10**	2,10 t=1,85	2,78 **t=2,39**	3,99 **t=3,43**	

Panel B			**Size**			
Findi stocks	**Quintile 1 Big**	**Quintile 2**	**Quintile 3**	**Quintile 4**	**Quintile 5 Small**	**Quintile (5-1)**
Price-to-earnings						
Quintile 1 High	0,95 (0,95)	0,77 (0,78)	0,98 (0,67)	1,28 (0,65)	2,43 (0,31)	1,25 t=0,72
Quintile 2	1,52 (1,00)	1,08 (0,79)	0,65 (0,61)	1,62 (0,50)	2,39 (0,24)	2,38 t=1,37
Quintile 3	1,74 (0,87)	2,88 (0,79)	1,20 (0,76)	2,04 (0,42)	3,38 (0,30)	2,45 t=1,42
Quintile 4	1,29 (0,73)	2,13 (0,20)	1,90 (0,83)	3,20 (0,60)	3,91 (0,25)	3,00 t=1,75
Quintile 5 Low	2,20 (0,81)	3,15 (0,49)	3,43 (0,68)	4,28 (0,48)	7,72 (0,24)	5,28 **t=3,08**
Quintile (5-1)	1,49 t=1,53	0,88 t=0,93	1,64 t=1,69	2,61 **t=2,81**	5,52 **t=3,57**	

Returns figures, in percent, are the average monthly return of each portfolio for the 120 months from July 1990 to June 2000. In Quintiles 1 to 5 post-ranking betas for the period are in parenthesis. In the last column and last row, labelled Quintile (5-1), the return figures are the average monthly difference in return between Quintiles 5 and 1 and *t* is the Students t-statistic indicating whether, on average, the difference is significant. Significance above the ninety-five percent confidence level is indicated in bold. **Figure 4 shows a graphical depiction.**

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