Mark-ups and competition – a comparison of the profitability of listed South African and American industrial companies

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Abstract:

Aghion, Braun and Fedderke (2008: 1-2) test product market competitiveness in South African manufacturing industries by calculating mark-ups in these industries and find that "the profitability margins as computed from the listed firms sample, is more than twice as large in South Africa than it is in other countries" for a sample from 1980 to 2004. They also find that the gap between mark-ups in South Africa and elsewhere has been persistent over this period. We test this claim empirically by using survivorship bias corrected datasets of the top 25 South African industrial firms listed on the JSE (by market capitalisation) and those in the Dow Jones Industrial Average index. We compare (for this period) the mark-ups (as measured by Aghion et al, 2008) and the relative profitability (as measured by Return on Equity (ROE) and Return on Invested Capital (ROIC)). This detailed study of different profitability measures provides a robustness test for the Aghion et al (2008) result based on a mark-up comparison between SA and US firms. Our results do not confirm the claim that South African industrial companies have enjoyed sharply higher mark-ups or rates of profitability when compared with their international counterparts.

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1. Introduction

It is commonly argued that competitive markets are necessary for economic growth and, more generally, that "competition is a good thing" in the words of Stephen Nickell (1996). Competition promises to provide incentives for efficient production and innovation and downward pressure on both costs and prices (Nickell, 1996: 724-725). If correct, this has implications for competition policy. However it is difficult to measure the extent of competition in a market directly. Researchers often use the size of the mark-ups of firms over their costs and/or the resulting levels of profitability as proxies for competition. In particular, Aghion, Braun and Fedderke (2008) (hereafter ABF) concluded that South African (SA) manufacturing firms operate in relatively uncompetitive markets based on their empirical observations that these firms have been able to generate abnormal profits when compared to their counterparts in other markets. More specifically, ABF claim that SA manufacturing firms have consistently been more profitable on a comparable basis over a period extending from the mid 1960s through to 2006. Using various estimates of mark ups and profitability, they suggest that SA firms have been between 50% and 100% more profitable than their international peers, hinting strongly at the need for stricter competition policies to protect the South African consumer.

We examine the empirical validity of this claim using a smaller, but more detailed data set based on the annual financial statements of the largest listed industrial companies based in SA and the United States (US) for the period 1980 to 2006. To deal with the potential impact of survivorship bias we construct a market capitalisation based index of the annual top 25 industrial firms for SA over this period. We then compare the profitability of these firms using the same measures applied by ABF and find that this profitability 'premium' does not exist for these firms for this period. Though the dataset used here is smaller than the ABF dataset in terms of firm coverage, their result needs to hold for the smaller dataset as well as it comprises the largest industrial firms. If the high mark-ups are not found for the largest industrial firms in an environment where these firms account for large proportions of their respective market shares then ABF's results about the lack of competition in the industrial sector cannot stand.

Section 2 of the paper reviews the literature relating to competition policy and economic growth. Section 3 outlines the methodology used to identify the firms and what data was collected. The results of this analysis are presented in Section 4 and Section 5 concludes the paper.

2. Literature Review

2.1 South African literature

The literature on the degree of competition in South African industry dates back several decades (Du Plessis, 1978, is an early example). Here, as elsewhere, the measures of competition have been studied along with measures of profitability, following Bain's (1951)

structure-conduct-performance hypothesis. Though much evidence has been presented on this hypothesis in South Africa (for example, Reekie, 1984; Leach, 1992; Fourie and Smith, 1993; Fourie and Smith, 2001) the debate has been inconclusive, and its many methodological, empirical and ideological problems forced the discussion into "gridlock" according to Fourie and Smith (1999: 87).

In addition to the problems of method and interpretation that has held back progress in this literature, ABF (2008: 9-10) have also argued that industry level data has become less reliable since the last manufacturing census (1996). They warned that "…the reliability of all results based on industry data are likely to decline substantially after 1996".

Despite these warnings on data quality and the earlier stalemate in the local literature Fedderke, Kularatne and Mariotti (2007) recently opened a new line of research on the profitability of South African manufacturing firms following the methodological innovations of, particularly, Roeger (1995). While growth accounting at the industry level could be used to calculate mark-up of price to marginal-cost based on changes to factor quantities, it is possible to derive a dual of the Solow Residual (and hence an expression for the same mark-up) based on changes in factor prices. Roeger (1995) exploited this dual of the Solow residual to find an expression for the mark-up that avoided some of the endogeneity problems present in the calculation of mark-ups using the standard Solow residual.

Fedderke et al. (2007) implemented and extended Roeger (1995) with a panel data set for South African manufacturing industries at the three-digit SIC level for the period 1970 to 1997 at an annual frequency. They extended Roeger's (1995) approach to a panel setting by using the Pooled Mean Group Estimator (PMGE) as proposed by Pesaran, Shin and Smith (1999) which allows for heterogeneity across industries in terms of intercepts, short run coefficients and error variances, while imposing homogenous long-run coefficients across industries.

They reported a series of results suggesting that mark-ups were considerably higher in South African industries than in the United States. Firstly, their estimate of the unadjusted long-run value for the mark-up across industries was around 80% compared with an average result of 45% for the literature on industries in the USA (Fedderke et al., 2007: 45-46). These results were then extended by controlling for various factors associated with the size of the mark-up, following *inter alia* Oliveira Martins and Scarpetta (1999). The second result of Fedderke et al. (2007: 47) is evidence that the mark-up in South African industries can sensibly be split into a constant component and a statistically significant counter-cyclical component.

Thirdly, Fedderke et al (2007: 49-51) controlled for the discipline that international trade might impose on the size of mark-ups in domestic industry. They find evidence supporting the intuitively plausible effect that greater exposure to import and export competition is associated with lower mark-ups. However, the subtlety of their result is to distinguish within-industry and between-industry effects for international competition and they found that the between-industry effect is the more powerful.

Fourthly, Fedderke et al (2007: 52) returned to the long-standing debate on market structure and mark-ups and found a powerful association between industry concentration and mark-ups, i.e. greater concentration is associated with higher mark-ups. Consequently, competition

policy aimed at lowering the degree of concentration in industry could, theoretically, lower pricing power of firms and in that way improve the competitiveness of South African industry, or so Fedderke et al (2007: 54) argued. Further, they explored the association between mark-ups and unit-labour cost as a measure of industry competitiveness. Again the results are subtle: an increase in within-industry cost-competitiveness lowers the mark-up, while an increase of cost competitiveness for an entire industry relative to the average for the manufacturing sector enjoys a higher mark-up, i.e. the increased cost competitiveness is not passed on to customers (Fedderke et al., 2007: 56-57).

The results from Fedderke et al (2007) mentioned up to this point suggests that South African industrial firms enjoy high mark-ups on an international comparison and that the mark-ups are related to characteristics of the South African industrials landscape, such as high concentration ratios. These findings from Fedderke et al (2007) confirm earlier evidence based on a multivariate co-integration model for inflation in South Africa by Fedderke and Schaling (2005). They estimated an average mark-up of 30% over unit labour cost for the South African economy (Fedderke and Schaling, 2005: 91), which was three times as large as comparable estimates for the United States by Ghali (1999).

But Fedderke et al (2007: 58) also report one final result that casts some ambiguity on these findings: adjusting their mark-up estimate to allow for intermediate goods they find a considerably reduced mark-up for South African industry. Not only is the estimate sharply lower (in a range of 6 to 9%) but it is also lower than comparable estimates for the USA (13%). Fedderke et al (2007: 59-60) offer two explanations for this result: firstly, they speculate that there might be errors-in variables-problem with the data on intermediate inputs, and secondly, that there might be an omitted variable bias. They offer evidence that incorporating concentration ratios as the potentially omitted variables yields an estimate of the local mark-up that is higher than the comparable figure for the USA[2].

ABF (2008) extended the work of Fedderke et al (2007) in three directions: firstly, they calculated mark-ups and other measures of profitability for South African industry using three data sets (an industry level panel data set from UNIDO, an industry level panel from TIPS and a firm level panel for listed companies). These data are for South African and a large international cross section. Secondly, they examined these measures of profitability over time and controlled for measures of product market concentration and, finally, they studied the association between product market competition (as measured) and their estimate of productivity growth.

We are particularly interested in the results ABF (2008) obtained from the firm level panel as this study offers firm level calculations as a robustness check. ABF's (2008) firm level panel contained data for listed companies in 56 countries, including South Africa, for the period 1980 to 2004. They found that listed South African firms earned profits on average around 50% higher than the international average when profitability was measured in terms of Net Income/Sales, Net Income/Assets and Net Income/ Equity. In contrast though, the same South African firms had much lower Gross Margin, Market to Book Ratio and Price-

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[2] Fedderke et al's (2007: 59) concern that "South African data on intermediate inputs is not fully reliable" is correct, but extends also to the other data used in studies of this kind, including especially industry concentration ratios.

Earnings Ratios. They also found no evidence of systematic variation over time for these measures of profitability, nor evidence that large firms enjoyed higher profits than smaller firms (Aghion et al., 2008: 11: 12). These are the results that are contested in this study using a market capitalization index of SA and US firms.

2.2 Survivorship bias

It has long been recognised that empirical studies based on data of listed companies can be subject to the effects of survivorship bias. This occurs when a sample is drawn only from the firms which are currently listed for which a historical series is then constructed in a backward-looking manner. This naïve selection will lead to biased historical estimates as it systematically ignores the results or data from firms that used to be listed but no longer form part of the relevant index. By excluding the firms that are no longer listed, data is collected only for the firms that have survived. In the context of this case, such a biased sample of firms and their returns would probably lead to exaggerated estimates of mark-ups and profitability, because it is usually the most profitable firms that survive.

Overcoming this problem involves a careful identification and inclusion in the sample frame of firms that are no longer listed[3] over the entire sample. Unfortunately ABF do not clearly specify which firms were included in their analysis. According to ABF (2008: 7) they used "firm-level (Worldscope) evidence from publicly listed companies. The firm-level evidence is based on Worldscope data for publicly-listed companies in 56 different countries since the early 1980s. The dataset contains yearly balance sheet and P&L items, and other basic firm characteristics." Table A2 in ABF suggests that the data was sorted by 3 digit (SIC) manufacturing industry. Table A3 then compares the ratios of the listed companies to those of the industry level as computed from the UNIDO's International Statistics data base. However there is no further discussion in the text of the nature of the firm level data set used. This very brief discussion does not answer the following very important questions:

1. How many companies were included for each country (most importantly, for South Africa)?
2. Has this data set been corrected for survivorship bias?

Given the long period (1980 – 2006) studied by ABF, the chances are very high that their sample is drawn from an incomplete list of firms. However, the lack of discussion of this bias by ABF and the lack of information as to the number or identity of the firms included in the analysis suggests that their conclusions may be subject to survivorship bias.

Given the lack of clarity on these key empirical issues we decided that a new firm-level data set corrected for survivorship bias would be necessary to test the robustness of ABF's claims. As is discussed in more detail in the next section, the use of indices is a practical way of dealing with the survivorship bias problem. By using component lists of comparable market capitalisation based indices for each year for the two markets we are able to identify a complete, but manageable, list of firms to be included in the analysis. We then establish the

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[3] Firms may no longer be listed for several reasons. They can go bankrupt or decide to de-list. Alternatively their market identities can change due to specific corporate actions e.g. mergers, acquisitions or restructurings. The effect is the same from a survivorship bias perspective.

extent to which survivorship bias exists in the data. This is a major advance over the data set used by ABF. However, this clarity comes at a price: the complexity of the data collection process limited us to the comparison of only two markets – SA and the USA. Although we report results for these two markets alone, it at least allows direct comparison with the claims advanced by (Fedderke et al., 2007), in terms of SA's competitiveness with respect to the US industrial market. The results proposed in the following sections should nonetheless serve as a robustness check for the ABF findings, although a clear avenue for future research should be to repeat our detailed analysis to include more markets.

3. Research Method

The key contribution of this paper is the estimation of mark-ups and profitability of manufacturing firms using a data set with minimal survivorship that would allow an international comparison. A key challenge was the construction of a list of SA industrial firms which would be comparable to a sample from the United States summarised by the Dow Jones Industrial Average (DJIA) index for the period 1980-2006. No such list existed for this period[4].

Data was collected at a firm level for listed industrial companies making up a top 25 industrial share index for the SA market (based on market capitalisation weighs)[5] and the for DJIA in the US. Firstly, the numbers of ordinary shares in issue and the share prices at each financial year-end[6] was collected with which the market capitalisation could be calculated for each company. Secondly, the top 25 firms on market capitalisation were identified for each year from 1980 to 2006 and these defined the index. In this way a total of 98 unique firms were included in the index over the sample period and are listed in Appendix A.

The DJIA was chosen as the representative US industrial firm index. It is made up of 30 shares of a wide range of large industrial firms. The component list of firms for this index was obtained and the annual returns for these firms were collected[7]. The list of 50 unique firms included in this index over this period is reported in Appendix B.

The method followed here minimised survivorship bias in the data. The extent to which the data collected differed from that required to eliminate the bias completely is summarised in Table 1 and the distribution of data gaps over the sample period is illustrated in Figure 1.

Table 1 about here

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[4] In 2002 the JSE adopted the FTSE index classification methodology. This was a completely different system to that used previously. Indices were only retroactively constructed back to 1998. Data relating to indices for earlier periods have not been maintained.

[5] Following ABF's reasoning one would assume that the largest industrial firms in SA exert the most market power. Indeed, ABF (2008: 10) confirms large manufacturing firms in SA as being relatively more profitable than smaller firms. Our investigation of the largest industrial firms by market capitalisation should, therefore, serve as a robustness check for ABF's results.

[6] The source of this data was Inet-Bridge – a local financial markets data provider.

[7] This data was obtained from Datastream – an international financial markets data provider.

Figure 1 about here

The data set is incomplete due to shortcoming in the electronic databases used. For example, no financial data was available at all for two South African firms included in the index. However the bulk of the missing observations were due to missing data points for some years only. Increasing the representation of the data set is a key next step for this research project.

Because there is some ambiguity in the profitability concepts used in ABF we used a broad range of potential definitions to ensure comparability. For example, ABF did define the profitability measures used in their ratios. Net Income for example could be interpreted as Operating Profit, Profit before Interest and Tax (PBIT) or Net Profit after Tax (NPAT). Results for all three definitions are presented and discussed below. Secondly, 'assets' could refer to either total assets (fixed + current assets) or net assets (fixed assets plus net current assets [= current assets – current liabilities]). We have used total assets as it gives a measure of performance that reflects the total stock of long and short-term assets used by the company to generate the profits for that period[8].

4. Results

ABF used the following ratios as proxies for mark-ups and profitability: Net Income/Sales; Net Income/Assets; Net/Income/Equity; Gross Mark-up; Market to Book ratio; Price to Earnings ratio. Due to limited data availability with respect to the income statement and market data variables at financial year-end, we were only able to calculate comparable results for the first three ratios, but this is precisely where we wish to confirm the robustness of the ABF results as it is for these three ratios that the South African firms exceeded the international average by 50% in ABF's results.

4.1 Relative Profit Margins – Operating Profit, PBIT and NPAT (Relative to Sales)

According to ABF (2006:11-12) "listed firms in SA exhibit 50% higher profitability when this is measured with Net Income/Sales, Net Income/Assets and Net Income/Equity" when compared to firms in the 56 other countries included in the Worldscope database. The results for these profitability margin ratios, relative to sales, for the median firms in our data set are shown in table 2a and 2b.

Table 2a about here

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[8] Strictly speaking the opening assets should be used to generate a 'return' measure as the closing values include the growth of the assets in the year under question. This will lead to lower return estimates. This is not a significant issue in this context as the same approach is used for both countries. As we are doing a comparative analysis, the bias is not important to the relative results.

Table 2b about here

For each measure of profitability and return reported here we also used the non-parametric Wilcoxon-Mann-Whitney statistic to test the null hypothesis that the particular measure for the JSE has a (stochastically) larger distribution than comparable measure for the DJIA. These test results are reported in table 3.

Table 3 about here

From the comparison of medians for the three measures of net income to sales over the entire period (1980 – 2006) in table 2a, US firms are more profitable according to the average annual Operating margin medians for firms on the DJIA, while SA firms did better in terms of both the PBIT and NPAT measures. The gaps were neither large though, nor persistent for any of the measures as can be seen from the decade averages in table 2b. During the 1980s SA firms were more profitable on all three measures than their US counterparts, largely similar in the 1990s and less profitable on all three measures in the 2000s (this is confirmed by the gross median comparisons for all three measures in table 3).

Table 3 also suggests that the distributions of Operating margins for the respective indices differ significantly for the 2000s, where the distribution of the DJIA lies significantly higher than that of the JSE (confirming the significantly higher averaged annual medians for this measure for firms on the DJIA for this decade). In contrast, as suggested by table 2b, the JSE PBIT and NPAT data seems to have been drawn from a significantly higher distribution than the DJIA for the 1980s. The PBIT measure for the 1990s suggests no significant difference in the distributions of the JSE and DJIA, while the NPAT measure of the JSE data seems to confirm a significantly higher distribution than that of the US. For both these measures, however, the DJIA data for the 2000s is drawn from a significantly higher distribution than firms on the JSE.

These tables therefore indicate that the largest SA industrial firms are clearly not the 50% to 100% more profitable than their US counterparts, as suggested by ABF. Moreover, the lack of a consistently larger profit margin for these SA firms (as compared to US firms) over this period also directly challenges the ABF results.

4.2 Relative Returns (on Assets and Equity)

ABF report that SA firms also perform consistently better than their international counterparts when profitability is measured by the firms' returns on assets used and on equity provided by shareholders. ABF define these measures as Net Income/Assets and Net Income/Equity. As pointed out earlier, there is a lack of clarity on the definition of Net Income by ABF. However, rather than present all three versions of these ratios we have decided to focus on NPAT as the measure of net income for the purposes of this section. NPAT is the amount of profit (not cash flow) available for distribution to shareholders. This

makes it the most appropriate measure of profit out of the three available for the calculation of returns in this context[9].

Another shortcoming of the ABF study is their failure to adjust their measures of profitability, relative to assets and equity, to control for the strong depreciation in the value of the rand since the 1980s. In this section we evaluate NPAT returns in common currency, and illustrate the difference it makes in the perceived level of profitability of SA firms for this period.

Table 4a about here

Table 4b about here

Table 5 about here

From table 4a and 4b it is evident that expressing the returns data in common currency yields a very different picture from the local currency results. From the first column of table 4.a the average ROA for the median SA firm for the period 1980 – 2006 is 8.9%, which is 3.5% higher than the equivalent median US firm. This 66% premium over the average median US firm's ROA disappears completely when taking into account the exchange rate depreciation for this period. The second columns shows the common currency comparison where the average ROA for the median SA firm is -1.2% in dollar terms, with the median SA firm having a higher ROA less than one third of the time (compared to more than 96% of the time when ignoring exchange rate fluctuations). The average ROA for all the SA firms reported by ABF is 5.9% suggesting that no adjustment was made to express the data in common currencies.

Table 4b compares the average returns on equity for the median SA and US firms, and shows a similarly significant difference when controlling for currency fluctuations. In the first column the local currencies data supports the ABF findings in suggesting a relatively high 22.2% average ROE for the median SA firm, as compared to 16.1% for the equivalent median US firm. In dollar terms, however, we see an average ROA of 12% for the median SA firm column 2), which is 32% lower than the comparable average for the US firms.

Table 5 reports the outcomes of hypothesis tests using the non-parametric Wilcoxon-Mann-Whitney statistic to test for equality in distribution for both the SA and US firms, in terms of their ROA and ROE measures in common currency, sorted by decade. For both measures, US firms are drawn from a significantly higher distribution than their SA counterparts for the 1980s and 1990s. During the 2000s there does not appear to be a statistically significant difference between the two countries' ROA measures, while the ROE for SA firms seems to be drawn from a significantly higher distribution than their US counterparts.

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[9] As pointed out in the previous section the correct way to estimate a return ratio is to use the opening assets or equity instead of the closing value as is done here. However as the point of this analysis is to establish relative returns and the calculations are performed consistently, there is no reason to suspect a bias.

The return on asset and equity data reported here show that only for one measure in one decade can it be said that the results for the large SA firms exceeded those of large US industrial firms on average.

5. Conclusion

ABF advanced a striking empirical claim about the relative profitability of SA industrial firms. This paper confronted their claims with a smaller, but carefully chosen, dataset of large listed industrial companies in both SA and the USA. Our analysis rejects their results if profitability is measured in terms of operating, PBIT or NPAT margins. Our data does not provide any evidence to conclude that SA industrial firms are consistently more profitable than their US counterparts for the period 1980 – 2006 in terms of these profitability ratios. Nor do we confirm their results if profitability is measured in terms of return to assets or – equity. In particular, our analysis shows that US firms display a significantly higher level of profitability for much of the sample period once currency fluctuations have been taken into account.

A key next step would be to improve the coverage from the current 97% for SA and 83% for the USA. In addition to this, more data is required for the other measures of profitability presented by ABF, namely Gross Margin, Market to Book Value and Price Earnings ratios of the large cap listed companies. Finally, our analysis could be extended to include more markets in order to provide a broader comparison of the relative profitability of firms in SA.

Appendix A: South African Industrial Companies

1   Abercom Group Limited
2   Adcock Ingram Limited
3   AECI Limited
4   African Cables Limited
5   African Oxygen Limited
6   Allied Electronics Corporation Limited
7   Allied Technologies Limited
8   Alpha Limited
9   Amalgamated Beverage Industries Limited
10   Anglo American Industrial Corporation Limited
11   Anglo American Properties Limited
12   Anglovaal Industries Limited
13   Aspen Pharmacare Holdings Limited
14   Barloworld Limited
15   Beverage & Consumer Industry Holdings Limited
16   Bidvest Group
17   Blue Circle Limited
18   C G Smith Foods Limited
19   C G Smith Limited
20   Cadbury Schweppes (South Africa) Limited
21   Charter - Sterling
22   Comparex Holdings Limited
23   Consol Limited
24   Cornick Group Limited
25   Darling And Hodgson Limited
26   Datatec Limited
27   Dimension Data Holdings Plc
28   Dorbyl Limited
29   Dunlop Africa Limited
30   Edgars Consolidated Stores Limited
31   Energy Africa Limited
32   Engen Limited
33   Everite Group Limited
34   Federale Volksbeleggings Beperk
35   Foodcorp Limited
36   Foschini Limited
37   Genbel South Africa Limited
38   Haggie Limited
39   Highveld Steel & Vanadium Corporation Limited
40   Hunt Leuchars & Hepburn Holdings Limited
41   Ics Holdings Limited
42   Imperial Holdings Limited
43   Iprop Holdings Limited
44   Jd Group Limited
45   Johannesburg Consolidated Invest Corp
46   Johnnic Holdings Limited
47   Kanhym Investments Limited
48   Kohler Limited
49   Malbak Limited
50   Massmart Holdings Limited
51   Messina Limited (Old)
52   Metkor Group Limited
53   MIH Holdings Limited

54   Mittal Steel S.A Ltd
55   MTN Group Limited
56   Murray & Roberts Holdings Limited
57   M-Web Holdings Ltd (Ex Mih/M-Web)
58   Nampak Limited
59   Naspers Limited -N
60   Network Healthcare Holdings Limited
61   New Africa Investment Limited
62   New Clicks Holdings Limited
63   Northern Engineering Industries Africa Limited
64   Ok Bazaars (1929) Limited
65   Pep Limited
66   Pepkor Limited
67   Pick `N Pay Stores Limited
68   Plate Glass & Shatterprufe Industries Limited
69   Polifin Limited
70   Premier Group Limited Old
71   Pretoria Portland Cement Company Limited
72   Primedia Limited
73   Profurn Limited
74   Rembrandt Group
75   Remgro Limited
76   Reunert Limited
77   Richemont Securities AG
78   Romatex Limited
79   Rothmans International - Sterling
80   SABmiller Plc
81   Safmarine & Rennies Holdings
82   Sappi Limited
83   Sasol Limited
84   Sentrachem Limited
85   Shoprite Holdings Limited
86   Southern Sun Hotel Holdings Limited
87   Steinhoff International Holdings Limited
88   Sun International (South Africa)
89   Sun International Limited
90   Super Group Limited
91   Technology Systems International Limited
92   Telkom SA Limited
93   Tiger Brands Limited
94   Tigon Limited
95   Toyota South Africa Limited
96   Trencor Limited
97   Truworths International Limited
98   Woolworths Holdings Limited

Appendix B: US Industrial Companies

1   3m
2   Alcoa
3   Altria Group
4   American Can
5   American Express
6   American Intl.Gp.
7   American Tobacco B
8   At&T
9   Bethlehem
10   Boeing
11   Caterpillar
12   Chevron
13   Citigroup
14   Coca Cola
15   Du Pont E I De Nemours
16   Eastman Kodak
17   Exxon Mobil
18   General Electric
19   General Foods
20   General Motors
21   Goodyear Tire & Rub.
22   Hewlett-Packard
23   Home Depot
24   Honeywell Intl.
25   Inco Homes
26   Intel
27   International Business Machines
28   Intl.Paper
29   Johns-Manville
30   Johnson & Johnson
31   JP Morgan Chase & Co.
32   McDonalds
33   Merck & Co.
34   Microsoft
35   Navistar Intl.
36   Pfizer
37   Primerica Corporation
38   Procter & Gamble
39   SBC Communications Incorporated
40   Sears Holdings
41   Texaco Incorporated
42   Union Carbide
43   United Technologies
44   US.Steel
45   USX Corporation
46   Verizon Comms.
47   Wal Mart Stores
48   Walt Disney
49   Westinghouse Electric
50   Woolworth

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Table 1: Extent of survivorship bias

Country	Observations required	Observations collected	%
SA	675	632	97%
USA	810	676	83%

Table 2a: Comparison of Profitability Margins relative to sales (SA vs US) over the period: 1980 - 2006

	Average of the annual Median Operating Margins	Average Median PBIT Margin	Average of the annual Median NPAT Margins	ABF Estimates[10] Net Income Margin
SA	11.1%	12.6%	7.1%	5.1%
US	12.2%	11.3%	6.2%	N/A[11]
Correlation Coefficient	-0.10	0.03	0.38	N/A
SA > US (% time)	41%	63%	59%	N/A

Table 2b: Comparison of Profitability Margins relative to sales (SA vs US) by decade

Measure of profitability or return	Decades					
	1980s		1990s		2000s	
	SA	USA	SA	USA	SA	USA
Operating margins	11.8%	10.6%	10.1%	11.71%	11.25%	15.14%
PBIT	13.1%	10.02%	11.7%	11.17%	13.18%	13.35%
NPAT	6.9%	5.01%	6.6%	6.07%	7.98%	8.07%

Table 3: Two-sample Wilcoxon-Mann-Whitney test for equal distributions

Measure of profitability or return	Decades					
	1980s		1990s		2000s	
	Higher median?	P-value[a]	Higher median?	P-value[a]	Higher median?	P-value[a]
Operating margins	JSE	0.16	DJIA	0.12	DJIA	0.00
PBIT	JSE	0.000	JSE	0.35	DJIA	0.23
NPAT	JSE	0.000	JSE	0.005	DJIA	0.64

a: The P-value shows the probability that the null hypothesis of equal distributions for the JSE and DJIA is not rejected given the data.

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[10] ABF (2008: Figure 3).

[11] ABF estimate that international firms on average generate a Net Income/Operating Margin of 3.3% (ABF, 2006: Figure 3).

Table 4a: Comparison of Returns on Assets and Equity (SA vs US): 1980 - 2006

	Average Return on Assets	Average Return on Assets (Common currency)
SA	8.9%	-1.2%
US	5.4%	5.4%
Correlation Coefficient	+12%	-12%
SA > US (% time)	96%	30%

Table 4b: Comparison of Returns on Equity (SA vs US): 1980 - 2006

	Average Return on Equity	Average Return on Equity (Common currency)
SA	22.2%	12.2%
US	16.1%	16.1%
Correlation Coefficient	25%	2%
SA > US (% time)	89%	41%

Table 5: Two-sample Wilcoxon-Mann-Whitney test for equal distributions

Measure of profitability or return	Decades					
	1980s		1990s		2000s	
	Higher median?	P-value[a]	Higher median?	P-value[a]	Higher median?	P-value[a]
ROA	DJIA	0.000	DJIA	0.000	JSE	0.42
ROE	DJIA	0.04	DJIA	0.02	JSE	0.01

Figure One: Distribution of data gaps over the sample period

Extent of Survivorship Bias in Sample (1980 - 2006)