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Financial Characteristics of High-Performance Companies in India

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ABSTRACT

Are recognized measures of performance in highly developed countries equally applicable to companies in rapidly growing emerging economies? Previous research has studied these connections in a mature economy (United States) and in a preliminary way in an emerging economy (India). In both studies, we found that the financial performance of the companies selected clearly reflected the expected performance characteristics of companies that emphasize strategic directions of operational excellence and product leadership (innovation). Most recently, we investigated empirically U.S. companies in the S&P 500 and companies that have displayed specific characteristics of high-performance companies (HPC): sustained and superior cash flow returns, asset growth, and total shareholder returns. In this study, we extend this previous research to India by investigating empirically the financial characteristics of Indian HPC. We hypothesize that the findings for U.S. HPC companies will hold true in the emerging Indian market. We investigate Indian companies in the BSE 200 index and companies that display specific characteristics of HPC—sustained and superior cash flow returns, and total shareholder returns. The study finds that the financial characteristics for U.S. HPC—superior total asset management, profitability, financial risk, liquidity, and operating asset management—hold true in the Indian market.

INTRODUCTION

This study continues our exploration of the links between strategy, execution, and financial performance. Our prior research (Frigo *et al* 2002, Needles *et al* 2004, Needles *et al* 2005) examined these links by emphasizing the underlying performance drivers that describe how a company executes

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strategy to create financial value. Our first studies examined the connection between strategy, strategic performance drivers and financial ratios in a mature economy (United States) and an emerging economy (India). In both studies, we found that the financial performance of the companies selected clearly reflected the expected performance characteristics of companies that emphasize strategic directions of operational excellence and product leadership (innovation). Most recently, we investigated empirically U.S. companies in the S&P 500 and companies that have displayed specific characteristics of high-performance companies (HPC): sustained and superior cash flow returns, asset growth, and total shareholder returns. The latter study supported the hypothesized relationships between integrated financial ratio performance measures as represented by the Financial Performance Scorecard™ (FPS) and also of above-mean performance by HPC across all performance measures when compared with the companies in the S&P 500 (Needles *et al* 2004, Needles *et al* 2005).

Previously, we also showed that strategy and financial performance were linked for selected Indian companies in a manner similar to matched U.S. companies. (Needles, *et al* 2002). In this new study, we again study the emerging market of India by empirically investigating companies in the BSE 200 index and companies that display specific characteristics of HPC. We find that HPC in India have statistically superior performance in the financial characteristics related to the five financial objectives of the financial performance scorecard—total asset management, profitability, financial risk, liquidity, and operating asset performance

PREVIOUS RESEARCH

As noted, the new research extends previous research, which investigated the relationship between strategy and financial ratio analysis (Frigo *et al* 2002, Needles *et al* 2004, Needles *et al* 2005). Further, it is related to previous research by, among others, Nissim and Penman (1999 and 2001). We also referenced Brief and Lawson (1992), Fairfield and Yohn (1999), Feltham and Olsson (1995), Fera (1997), Jansen and Yohn (2002), Lev and Thiagarajan (1993), Ohlson (1995), Penman (1991), Piotroski (2000), and Selling and Stickney (1989).

Frigo and Litman (2002) have emphasized a "Return Driven Strategy" under which business activities are ethically aligned with achieving maximum financial performance and shareholder wealth. Financial statements reflect how well a company's management has carried out the strategic and operating plans of the business. Analysts evaluate performance by conducting ratio analysis related to various aspects of a business's operations. The marketplace, in turn, evaluates this performance, and a value is placed on the company.

Our previous research (Needles *et al* 2004) has shown empirically how ratios interact in integrated financial ratio analysis, which we call the Financial Performance Scorecard (FPS), to show whether a company is creating or destroying value. The FPS is a structure or framework for considering the interaction of financial ratios, with particular emphasis on the drivers of performance and their relationship to performance measures. These performance measures are reflected ultimately in a return that is compared with a benchmark cost of capital. If the return exceeds cost of capital, value has been created. If the return is less than cost of capital, value has been destroyed. The "spread" between return on investment and the cost of capital was used as a criterion for selecting the leading companies; however, for purposes of evaluating the FPS in this study, we will assume that the cost of capital is determinable and given (Adman and Haight 2002; Gebhardt, et al., 2001).

The FPS is based on the premise that management must achieve certain financial objectives in order to create value and that these financial objectives are interrelated. Further, underlying the performance measures that analysts and the financial press commonly use to assess a company's financial performance are certain financial ratios, called performance drivers, that are critical to achieving the performance measures. We found that while HPC uniformly excel on the basis of performance measures, they will not display uniform characteristics when it comes to performance drivers, because these measures are more a function of the various strategies that the companies may employ to achieve high performance (Needles *et al* 2004). The relationship of financial objectives, performance drivers, and performance measures may be visualized as shown in Fig. 1.

FIGURE 1

Integrated Financial Ratio Analysis :
The Financial Performance Scorecard (FPS)
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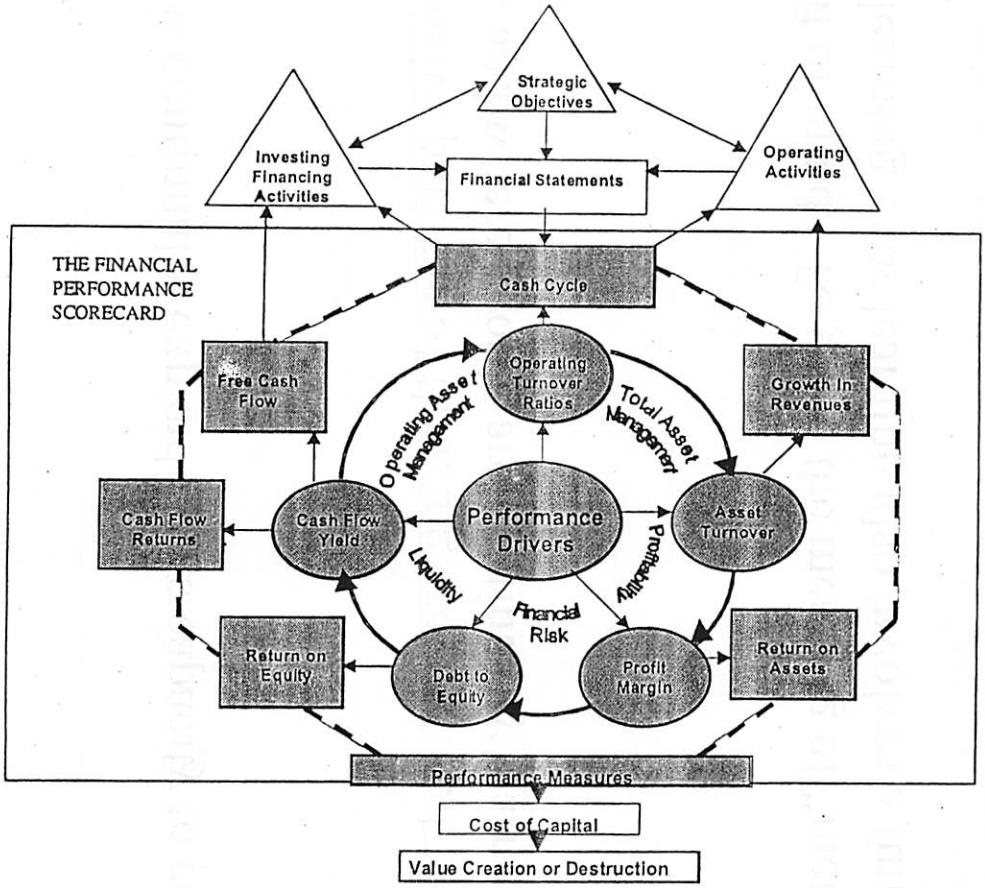

Profitability and liquidity are traditionally the two most prominent financial objectives. An expanded view of these objectives includes the following (Needles *et al* 2004):

Financial Objectives	Links to Financial Performance
Total asset management	Ability to utilize all the assets of a company in a way that maximizes revenue while minimizing investment
Profitability	Ability to earn a satisfactory net income
Financial risk	Ability to use debt effectively without jeopardizing the future of the company
Liquidity	Ability to generate sufficient cash to pay bills when they're due and to meet unexpected needs for cash
Operating asset management	Ability to utilize current assets and liabilities to support growth in revenues with minimum investment

The components of the FPS are summarized as follows (Needles *et al* 2004):

Financial Objective	Performance Drivers	Performance Measures
Total asset management	Asset turnover	Growth in revenues
Profitability	Profit margin	Return on assets
Financial risk	Debt to equity	Return on equity
Liquidity	Cash flow yield	Cash flow returns Free Cash flows
Operating asset management	Turnover ratios	Cash cycle

The formulae for the ratios addressed in this study appear in *Appendix A*. Specifically, our previous research investigated (1) evidence with regard to the components of the FPS—in particular, the relationships between the performance drivers and the performance measures and (2) the relationships between the performance of the HPC and that of their respective industries.

The empirical results confirmed the basic propositions of the FPS and the criteria for choosing HPC. These results are summarized as follows:

1. The performance drivers and performance measures are independent of each other, as shown by low correlation among each other or low rank correlation. This proposition held true for all companies, for selected industries, and for industry leaders, all of which show independence among the ratios, with low correlations among performance drivers (except asset turnover and profit margin) and performance measures.
2. The criteria for choosing HPC were validated by the performance measures in the FPS model. The HPC exceed the industry averages across all performance measures and across all industries.
3. The HPC show mixed results with regard to performance drivers when compared with industry drivers. HPC excel on profit margin, are lower on cash flow yield, have lower financial risk, and have variable results for asset turnover. We believe these results are due in part to the different strategies that companies may employ.

Our previous research also addressed the financial objective of operating asset management. The goal of liquidity is closely related to the goal of operating asset management. Operating asset management is a measure of management control of the cash conversion cycle, which is the time required to make or buy products, finance the products, and sell and collect for them. Operating asset management is the ability to utilize current assets and liabilities in a way that supports growth in revenues with minimum investment. The drivers of operating asset management are the turnover ratios, and the performance measures are the days represented by each turnover measure, as follows:

Performance Driver	**Performance Measure**
Receivables turnover	Days' sales uncollectible
Inventory turnover	Days' inventory on hand
Payables turnover	Days' payable

The calculations of these ratios are contained in *Appendix A.* Taken together, the performance measures give an indication of the financing period, as shown by the following formula:

Financing period =
days' receivable + days' inventory on hand – days' payable

The financing period represents the amount of time during which a company must provide financing for its operating activities.

Our expectation in our previous research was that HPC would have a shorter financing period than S&P companies because their superior financial performance would be a reflection of their operating efficiency. The previous results may be summarized as follows:

1. The financing period for HPC compared to S&P companies was shorter in almost all cases by about 28 days for the 1997-2001 period and 30 days for the 2002-2003 period, which equates to fewer days that need financing, thus lowering the financing costs for HPC relative to S&P companies.
2. The operating asset turnover ratios, however, showed more variability among industries and between HPC and S&P companies. We expected HPC to outperform S&P companies on receivables turnover, and this was generally the case; however, overall, the HPC advantage was nonsignificant. This result could be accounted for by the fact that HPC have less need to sell receivables and take advantage of off-balance-sheet financing than S&P companies. Further, HPC are better able to take advantage of trade creditors.
3. Inventory turnover ratios were in line with our expectations that the HPC would outperform the S&P companies. Inventory turnover for HPC exceeded that of S&P, which represents fewer days of financing needed, more than offsetting the shortfall from receivables.
4. HPC had a slighly lower payable turnover than S&P companies. Strong operating results and low debt loads of HPC enable these companies to obtain longer terms than average from their trade creditors, which accounted for most of the difference. Thus, the HPC' deficiencies noted above in receivables and inventory are overcome, so that these companies outperform their industry on the financing period.

EMPIRICAL OBJECTIVES

In this study, we continue our investigation of high-performance companies (HPC) and integrated financial ratio analysis, but this time focus on companies in India. Similar to previous studies, we empirically investigate the hypothesis that compared to BSE 200 companies, India HPC will have statistically superior performance in the financial characteristics related to the first four financial objectives of the financial performance scorecard—total asset management, profitability, financial risk, liquidity, and operating asset management. We perform the analysis over two separate time periods.

The first test period was the 5-year period 1997 to 2001. For the Indian market, this period included alternating periods of slight growth and slight decline, with a peak in 2000. The second test period was the 4-year period of 2002 to 2005, which was characterized by a time of rapid growth in India. The periods are good determinants of whether the HPC can sustain superior performance over changing markets conditions.

EMPIRICAL SAMPLE

The source of the data for this study was the Thomson One Banker database, also known as the Worldscope database. Our analysis focused on two groups of companies: companies in the BSE 200 index, and HPC. In the benchmark group, we started with companies in the BSE 200 index for which data exists consecutively from 2001 to 2005. In the benchmark group, we included companies from the BSE 200 index with the following adjustment: we excluded several industries whose financial structures typically depart from industrial, retail, and service businesses. These industries are banks, other financial institutions, financial services (broker) companies, insurance companies, hotels, and a hospital. The adjustment improved the comparability of the benchmark group with the HPC. After the first screen, our sample had 164 BSE companies. In order to lessen the variability of the benchmark group due to the small sample size, we expanded the number of companies in the benchmark to include those that were in the BSE 200 at any time during the entire period studied, 1997 to 2005. When making this adjustment, we eliminated any companies that were included in the BSE 200 for the first time after 2005. Companies included in the HPC were also removed from the BSE 200 sample. After all screens, the benchmark group had 201 companies.

In determining our HPC for India, we identified companies according to the following criteria (where data was available from 2001 to 2005):

- Cash flow return on investment (CFROI) at twice or more the cost of capital or greater than 5% discount rate in India
- Growth rates in assets greater than or equal to the gross domestic product
- Relative total shareholder returns (TSR) above the BSE 200 average

The criteria produced 25 high performance companies. These companies are listed in *Appendix B.*

In the analyses, companies were grouped by the first two digits of the SIC code. Fifteen industries were identified based on this grouping. For many industries, use of the first three digits of the SIC code did not provide enough companies to derive reliable industry averages. In most industries, there were not enough HPC to discuss industry-specific results, except for industry 28, chemicals and allied products, where the industry results were comparable to overall results for all industries.

DISCUSSION OF RESULTS

The results of the analyses are discussed in two sections: (1) effect of outliers, and (2) financial characteristics of HPC compared to BSE 200 companies. When referencing the previous study, we are referring to the study of the performance of US HPC compared to S&P 500 companies (Needles, *et al.*, 2006).

We tested ratios whose correlation was more then 0.5 for statistical significance. We ran correlation significance test - linear regression. We examined SIG (< 0.05) and t (T>1). We used stepwise variable selection method. We found that all correlations more than .5 were significant both for SIG and t tests. SIG was significant at the .001 level in almost all cases.

EFFECT OF OUTLIERS

The results of the tests for periods 1997-2001 and 2002-2005 are shown in Tables 1a and 1b. The results are shown both with and without outliers. In order to detect and eliminate outliers in the samples, we applied the Grubbs' test (NIST/SEMATECH). The Grubbs' test detects one outlier at a time. The outlier is expunged from the dataset and the test is iterated until no outliers are detected. There are no outliers at the specific significance level if the Grubbs' test statistic is less than the upper critical value for the Grubbs' test statistic distribution corresponding to that specific level. To get better results on the T-test, we eliminated outliers for various ratios. In only three cases out of twenty-one possible did outliners represent more than 2 percent of the sample. In these cases, outliers represent less than 5% of the sample. The elimination of outliers did not change the conclusions reached in examining the full set of data, but did affect the significance level on some ratios. In most cases, the results improved with the elimination of outliers. In the following sections, we will discuss the results with outliers eliminated, unless otherwise noted.

FINANCIAL CHARACTERISTICS OF HPC

Period 1997-2001 results

Table 1a compares the HPC with the BSE 200 companies on performance drivers and performance measures related to the objectives of total asset management, profitability, financial risk, and cash flow efficiency for the period 1997-2001. These tables show the percentage differences and the absolute measures, respectively, of HPC versus BSE 200 companies. Table 1b shows the same measures for HPC and BSE 200 companies for 2002-2005. The results for the first test period 1997-2001 are summarized as follows:

1. The overall industry analyses for 1997-2001 (Table 1a) show consistent results across all performance drivers and measures. HPC are more profitable (profit margin and return on assets), and have lower financial risk (debt to equity and return on equity), and have better utilization of assets (asset turnover). Cash flow yield is lower for HPC, but cash flow returns are consistently higher for the HPC across all industries. Using the t-test, 3 of the 4 performance drivers and 5 of the 6 performance measures are significant at least at the .0005 level or better.

2. In the period 1997-2001 (Table 1a), HPC exceeded BSE 200 companies on an overall basis on the performance driver of asset turnover by 11.54%, which was significant at the .05 level. HPC exceeded BSE 200 companies in the performance measure of growth in revenues by 53.25%, which was significant at the .0000001 level.
3. Financial risk as measured by debt to equity was much less for HPC than for BSE 200 companies (by 62.95%). This result was expected due to the HPC's lower need for debt financing. The result of this reduced debt to equity was that return on equity was greater for HPC by 40.93%. The differences in debt to equity and return on equity were significant at the .0000001 level.
4. Cash flow yield was also lower for HPC than for BSE 200 companies by 37.02%. This period also produced better relative performance measures for HPC for cash returns on total assets (34.96%) and cash flow returns on stockholders' equity (21.18%). All cash flow returns differences were significant at the .005 level or better.

In summary, HPC were shown to maintain superior asset management and performance profitability, lower financial risk, and stronger cash flow returns compared to the benchmark group over an economic period that contained fluctuating market conditions in India.

Period 2002-2005 results

The second test period 2002-2005 is a good test period of superior performance by HPC because it represents a contrasting period of rapid growth in the Indian market cycle from the 1997-2001 cycle. Our expectation was that the HPC would continue to outperform the BSE 200 companies in this period, given that the overall market conditions in India have improved. Table 1b shows the measures for 2002-2005 for total asset management, profitability, financial risk, and cash flow efficiency drivers and measures. The following observations may be made:

1. For this period, the overall industry analysis shows similar results in favor of the HPC, especially in the profit margin driver and the growth in revenue measure. Overall, 3 of the 4 drivers and 5 of the 6 measures have differences that are significant at least at the .0001 level or better. The only exception is the driver of asset turnover, where the difference is statistically significant at the .05 level. These results indicate that HPC are maintaining their superior position with regard to performance measures and drivers, although with more variation.
2. HPC continue to have lower debt to equity ratios and thus lower financial risk but continue to have superior return on equity. They also have superior results with regard to cash flow yield and generate superior cash flow returns.

These results strongly support the proposition that HPC maintain superior performance with regard to asset management, profitability, financial risk, and cash flow efficiency drivers through changing market conditions.

TABLE 1a

Percentage Difference between HPC and BSE 200 Companies—1997-2001

Industry	***Performance Drivers***				***Performance Measures***					
	Asset turnover	*Profit margin*	*Debt to equity*	*Cash flow yield*	*Growth in revenues*	*Return on assets*	*Return on equity*	*Cash flow returns on total assets*	*Cash flow returns on stockholder' equity*	*Free cash flow*
HPCs	1.05	0.16	0.89	1.16	0.18	0.13	0.23	0.13	0.23	0.01
BSE 200	0.95	0.07	1.90	3.76	0.07	0.07	0.13	0.09	0.19	-0.02
Difference	0.11	0.09	-1.01	-2.61	0.10	0.06	0.10	0.04	0.04	0.03
With Outliers	10.22%	56.35%	-112.55%	-224.77%	58.55%	48.41%	42.91%	31.11%	16.87%	228.67%
T-test	0.065050	0.000000	0.000573	0.040435	0.000000	0.000000	0.000000	0.000017	0.024703	0.002156
HPCs	1.05	0.16	0.89	1.12	0.18	0.13	0.23	0.13	0.23	0.02
BSE 200	0.93	0.08	1.46	1.53	0.08	0.07	0.14	0.08	0.18	-0.02
Difference	0.12	0.08	-0.56	0.41	0.09	0.06	0.09	0.05	0.05	0.04
With Outliers	11.54%	50.53%	-62.95%	-37.02%	53.25%	48.36%	40.93%	34.96^	21.18%	213.08%
T-test	0.042927	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	0.002290	0.000246

TABLE 1b

Percentage Difference between HPC and BSE 200 Companies—2002–2005

Industry	***Performance Drivers***				***Performance Measures***					
	Asset turnover	*Profit margin*	*Debt to equity*	*Cash flow yield*	*Growth in revenues*	*Return on assets*	*Return on equity*	*Cash flow returns on total assets*	*Cash flow returns on stockholder' equity*	*Free cash flow*
HPCs	1.07	0.14	0.96	1.49	0.17	0.13	0.23	0.16	0.29	0.06
BSE 200	1.03	0.06	20.5	2.81	0.05	0.07	0.16	0.11	0.17	0.01
Difference	0.04	0.08	-1.09	-1.31	0.12	0.06	0.08	0.04	0.11	0.05
With Outliers	3.50%	58.72%	-113.53%	-87.79%	69.71%	43.89%	33.49%	27.60%	39.52%	84.80%
T-test	0.301470	0.000000	0.000000	0.021269	0.000349	0.000000	0.000745	0.000032	0.078633	0.000000
HPCs	1.07	0.14	0.96	1.30	0.17	0.13	0.23	0.16	0.29	0.06
BSE 200	0.95	0.07	1.62	2.08	0.09	0.07	0.15	0.11	0.24	0.02
Difference	0.12	0.07	-0.66	-0.78	0.08	0.06	0.08	0.05	0.05	0.04
With Outliers	10.99%	50.44%	-68.84%	-59.79%	47.96%	44.63%	35.62%	28.61%	17.87%	75.44%
T-test	0.047348	0.000000	0.000000	0.000000	0.000001	0.000000	0.000001	0.000014	0.006472	0.000001

OPERATING ASSET MANAGEMENT CHARACTERISTICS

Period 1997-2001 results

Table 2a compares HPC with BSE 200 companies for the period 1997-2001. Table 2b provides the same comparisons for the period 2002-2005. Our expectation was that HPC would have a shorter financing period than BSE 200 companies because their superior financial performance would be a reflection of their operating efficiency. The results for 1997-2001 may be summarized as follows:

1. The financing period for HPC was shorter overall for period 1997-2001. Table 2a shows that the financing period for the HPC group was shorter by 4.38% for the period 1997-2001, thus lowering the financing costs for HPC relative to BSE 200 companies.
2. HPC also outperform BSE 200 companies in the operating asset turnover ratios. We expected HPC to outperform BSE 200 companies on receivables turnover, and as shown in Table 2a, HPC exceeded the benchmark by 26.58%, which was significant at the .0005 level.
3. The inventory turnover ratios are also in line with our expectations that the HPC would outperform the BSE 200 companies. Inventory turnover for HPC in the 1997-2001 period exceeded that of BSE 200 companies by 23.87% (significant at the .005 level), which represents fewer days of financing needed.
4. For the 1997-2001 period, HPC have a payable turnover that is 68.22% lower than that of BSE 200 companies, which was significant at the .01 level. Strong operating results and low debt loads of HPC enable these companies to obtain longer terms than average from their trade creditors.

TABLE 2a

Percentage Difference between HPC and BSE 200 Companies—Operating Assets Management—1997–2001

Industry	*Performance Drivers*			*Performance Measures*			
	Receivables turnover	*Inventory turnover*	*Payables turnover*	*Days' sales uncollected*	*Days' inventory on hand*	*Days' payable*	*Financing period*
HPCs	5.59	74.27	22.89	65.32	4.91	15.95	54.29
BSE 200	4.45	35.51	10.79	82.10	10.28	33.82	58.57
Difference	1.14	38.76	12.1	-16.78	-5.37	-17.87	-4.28
With Ourliers	20.44%	52.19%	52.84%	-25.69%	-109.18%	-112.06%	-7.87%
T-test	0.005016	0.265300	0.046346				
HPCs	5.59	7.72	22.89	65.32	47.25	15.95	96.63
BSE 200	4.10	5.88	7.27	88.98	62.07	50.19	100.86
Difference	1.49	1.84	15.62	-23.65	-14.82	-34.24	-4.23
With Ourliers	19.18%	82.89%	68.22%	-36.21%	-31.36%	-214.70%	-4.38%
T-test	0.000109	0.042699	0.012987				

TABLE 2b

Percentage Difference between HPC and BSE 200 Companies—Operating Assets Management—2002-2005

Industry	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Days' sales uncollected	Days' inventory on hand	Days' payable	Financing period
HPCs	6.62	127.76	34.82	55.14	2.86	10.48	47.52
BSE 200	5.77	36.35	8.07	63.21	10.04	45.21	28.04
Difference	0.85	91.41	26.75	-8.07	-7.18	-34.73	19.48
With Ourliers	12.77%	71.55%	76.82%	-14.63%	-251.49%	-331.37%	40.99%
T-test	0.068740	0.147536	0.033989				
HPCs	6.62	10.74	9.56	55.14	33.99	38.17	50.97
BSE 200	5.44	7.70	7.00	67.14	47.41	52.17	62.39
Difference	1.18	3.04	2.57	-12	-13.42	-14	-11.43
With Ourliers	17.88%	28.31%	26.83%	-21.77%	-39.49%	-36.67%	-22.42%
T-test	0.017091	0.006435	0.015416				

Period 2002-2005 results

Our expectation was that HPC would continue to outperform BSE 200 companies in operating asset management because of their superior financial performance in the period 2002-2005. The results for this period may be summarized as follows:

1. The financing period for HPC was also shorter overall for period 2002-2005. Table 2b shows that the financing period for the HPC group was shorter by 22.42% for the period. These results were stronger than the first test period.
2. HPC continued to outperform BSE 200 companies in the operating asset turnover ratios, however, to a varying degree of significance. We expected HPC to outperform BSE 200 companies on receivables turnover, however, in period 2002-2005, the significance was only at the .01 level.
3. The inventory turnover ratios are still in line with our expectations for period 2002-2005. Inventory turnover for HPC in the exceeded that of BSE 200 companies by 28.31% (significant at the .01 level). Similar to the behavior of the financing period, these results were stronger for period 2002-2003.
4. HPC have a payable turnover that is lower than that of BSE 200 companies, which was significant at the .01 level. Strong operating results and low debt loads of HPC enable these companies to obtain longer terms than average from their trade creditors.

In summary, HPC excel at inventory management, push their creditors to the limit, and are willing to accept a higher level of receivables. HPC are able to maintain their performance and lower financing period though changing market conditions, however, in a period of strong growth, the results were less statistically significant.

CONCLUSION

We began this research with the objective of replicating the previous study of US HPC for Indian companies. We concluded that Indian HPC are able to sustain superior performance through changing market conditions, including periods of decline and rapid growth, as demonstrated by their performance over the financial drivers and measures. This study confirmed that the characteristics of HPC for US companies also hold in an emerging market, India.

LIMITATIONS AND FUTURE RESEARCH

This exploratory study, which we consider part of on-going research in the area of strategy and financial performance measurement, has several limitations, some of which we expect to study in future research. First, we were limited to two SIC industry codes due to the small sample size. This was due to our limiting our sample to BSE 200 companies. If we expand our sample size sufficiently to analyze at the three-digit SIC level, we expect to find similar results to this study. Second, we were not able to expand this study to the industry level, because only one industry had enough HPC to produce significant results. If we expand the sample size, we expect to find similar results at the industry level. Future research will compare Indian HPC to US HPC across all performance drivers and measures.

References

Adman, M. A. and Haight, G. T. (2002). A Fresh Look at Economic Value Added: Empirical Study of the Fortune Five-Hundred Companies, *The Journal of Applied Business Research 18, no. 2, 27-36.*

Brief, R. P. and Lawson, R. A. (1992). The Role of the Accounting Rate of Return in Financial Statement Analysis, *The Accounting Review* 67, 411-26.

Fairfield, P. M. and Yohn, T. L. (1999). Changes in Asset Turnover Signal Changes in Profitability, *McDonough School of Business,* February, Washington, D.C.: Georgetown University.

Feltham, G. A. and Olsson, J. A. (1995). Valuation and Clean Surplus Accounting for Operating and Financial Activities, *Contemporary Accounting Research* 11, 689-731.

Fera, N. (1997). Using Shareholder Value to Evaluate Strategic Choices, *Management Accounting,* November, 45-55.

Frigo, M. L. **(2003a)**. Performance Measures That Drive the First Tenet of Business Strategy, *Strategic Finance* , September.

Frigo, M. L. **(2003b)**. Performance Measures That Drive the Goal Tenets of Strategy, *Strategic Finance* , October.

Frigo, M. L. and Litman, J. (2002). What Is Return Driven Strategy? *Strategic Finance,* February, 11-13.

Frigo, M. L., Needles, B. E., and Powers, M. (2002). Strategy and Financial Ratio Performance Measures, *Performance Measurement and Management Control,* London: JAI Elsevier Science Ltd.

Gebhardt, W. R., Lee, C. M., and Swaminathan, B. (2001) Toward an Implied Cost of Capital, *Journal of Accounting Research* 135-176.

Jansen, I. and Yohn, T. L. (2002). Using Changes in Asset Turnover as Signal of Potential Earnings Management, *McDonough School of Business,* Washington, D.C.: Georgetown University, October.

Lev, B. and Thiagarajan, S. R. (1993). Fundamental Information Analysis, *Journal of Accounting Research* 31, 190-215.

Litman, J. and Frigo, M. L. (2004). When Strategy and Valuation Meet—Five Lessons from Return Driven Strategy, *Strategic Finance,* August, 31-39.

Madden, B. J. (1999). *CFROI Valuation,* Oxford: Butterworth Heinemann.

Needles, B. E., Frigo, M. L., and Powers, M. (2002). Strategy and Financial Ratio Performance Measures: The Case of An Emerging Economy, *Indian Accounting Review* 6, No 2.

Needles, B. E., Frigo, M. L., and Powers, M. (2004). Strategy and integrated financial ratio performance measures: Empirical evidence of the Financial Performance Scorecard and high-performance companies. In M. Epstein and J. Manzoni (Eds.), *Performance Measurement and Management Control: A Compendium of Research: Studies in Managerial and Financial Accounting* (Vol 14, pp. 115-151). London: JAI Elsevier Science Ltd.

Needles, B. E., Frigo, M. L., and Powers, M. (2006) Strategy and Integrated Financial Ratio Performance Measures: Further Evidence of the Financial Performance Scorecard and High-Performance Companies. In M. Epstein and J. Manzoni (Eds.), *Performance Measurement and Management Control and Society: Studies in Managerial and Financial Accounting,*(Vol. 16, pp. 241-267). London: JAI Elsevier Science Ltd.

NIST/SEMATECH, *e-Handbook of Statistical Methods,* http://www.itl.nist.gov/div898/handbook/, 2006

Nissim, D. and Penman, S. H. (1999). Ratio Analysis and Equity Valuation. Working paper.

Nissim, D. and Penman, S. H. (2001). Ratio Analysis and Equity Valuation: From Research to Practice, *Review of Accounting Studies* 6, 109-54.

Ohlson, J. A. (1995). Earnings, Book Values, and Dividends in Equity Valuation, *Contemporary Accounting Research*11, 661-867.

Penman, S. H. (1991). An Evaluation of Accounting Rate-of-Return, *Journal of Accounting, Auditing and Finance* 6 233-55.

Piotroski, J. D. (2000). Value Investing: The Use of Historical Financial Statement Information to Separate Winners from Losers, *Journal of Accounting Research* 38 (Supplement).

Selling, T. I. and Stickney, C. P. (1989). The Effects of Business Environment and Strategy on a Firm's Rate of Return on Assets, *Financial Analysts Journal,* January-February.

APPENDIX A
FORMULAE FOR RATIO COMPUTATIONS

Performance Drivers		
Asset turnover	:	Net sales / average total assets
Profit margin	:	Net income / net sales
Debt to equity	:	(Total assets - stockholders' equity) / stockholders' equity
Cash flow yield	:	Cash flows from operating activities / net income (In the analysis, if either the numerator or denominator of the cash flow yield was negative, the ratio was excluded.)
Valuation Performance Measures		
Growth in revenues	:	Change in net sales / net sales
Return on assets	:	Net income / average total assets
Return on equity	:	Net income / average stockholders' equity
Cash flow returns	:	Cash flows from operating activities / average total assets Cash flows from operating activities / average stockholders' equity
Free cash flow	:	Cash flows from operating activities – dividends + sales of capital assets – purchases of capital asset. (In the analysis, to adjust for size of company, free cash flow was divided by average total assets.)
Operating Asset and Financing Ratios		
Receivables turnover	:	Net sales / average accounts receivable
Average days' uncollected	:	365 / receivables turnover
Inventory turnover	:	Cost of sales / average accounts inventory
Average days' inventory on hand	:	365 / inventory turnover
Payables turnover	:	(Cost of sales + or – change in inventory) / average accounts payable
Average days' payable	:	365 / payables turnover
Financing period	:	Average days' sales uncollected + average days' inventory on hand - average days' payable

APPENDIX B

HIGH-PERFORMANCE COMPANIES

Company Name	SIC Code	Description
ABB Limited (India)	3613	ABB is a manufacturer of automation and process control systems, electronic components, instrumenta tion and measurement devices, and power substations.
Bajaj Auto Limited	3751	Bajaj Auto is a manufacturer of motorcycles and Vespa-style scooters.
Bharat Heavy Electricals Limited	3443	Bharat Heavy Electricals is a gas and steam turbine manufacturer.
Bharat Petroleum Corporation Limited	2911	Bharat Petroleum is an oil company.
Cipla Ltd	2834	Cipla is a pharmaceutical company.
Dr. Reddy's Laboratories Limited	2834	Dr. Reddy's Laboratories is a pharmaceutical company.
GAIL (India) Limited	1321	GAIL (Gas Authority of India Limited) is a state-owned gas utility company.
GlaxoSmithKline Pharmaceuticals Ltd	2834	GlaxoSmithKline is a pharmaceuticals and healthcare company.
Grasim Industries Limited	3241	Grasim Industries manufactures and distributes cement, fiber/pulp, sponge iron, textile, chemicals, and others.
Gujarat Ambuja Cements Limited	3241	Gujarat Ambuja is a cement company.
HCL Technologies Limited	7372	HCL Technologies is a global IT services company.
Hero Honda Motors Limited	3751	Hero Honda Motors is a producer of two-wheeler motorcycles.
Hindalco Industries Limited	3334	Hindalco Industries is a producer of aluminum and copper.
Hindustan Petroleum Corporation Limited	2911	Hindustan Petroleum is a government-owned petroleum refining company.
I.T.C. Limited	2111	ITC has a diversified presence in cigarettes, hotels, paperboards, packaging, and agri-exports, among other industries.
Infosys Technologies Limited	7371	Infosys Technologies provides consulting and IT services.

Company Name	SIC Code	Description
Mahindra & Mahindra Limited	3711	Mahindra & Mahindra is a manufacturer of tractors and multi-utility vehicles.
Ranbaxy Laboratories Limited	2834	Ranbaxy Laboratories is a pharmaceuticals company.
Reliance Energy Ltd	4911	Reliance Energy is a private sector power utility company.
Reliance Industries Limited	2911	Reliance Industries is a petrochemical firm.
Satyam Computer Services LTD	7372	Satyam Computer Services is a consulting and IT services company.
Sun Pharmaceuticals Industries LTD	2834	Sun Pharmaceuticals Industries is a pharmaceuticals company.
Tata Power Co.	4911	Tata Power Company is a private sector power utility.
Wipro Technologies Limited	7375	Wipro Technologies is an IT service company.
Zee Telefilms Limited	4833	Zee Telefilms is a media and entertainment company.