

THE MANAGERIAL EFFICIENCIES OF INDIAN FIRMS AS COMPARED TO AMERICAN FIRMS

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ABSTRACT

This paper evaluates the relative managerial efficiencies of fourteen matched-pair American (U.S.) and Indian firms. In this study, the notion of managerial efficiency is defined in terms of profitability, debt management, and asset management. Paired comparison is employed and eight hypotheses are tested on the basis of defined ratios. Because matched pairs are used, an appropriate test is the Wilcoxon matched-pairs signed-ranked test. All the data for the study were compiled by the author from Mergent on Line. These include the most recent five-year time-series data that were available in 2011 for all the eight ratios that were tested. The analysis presented in this paper indicates the absence of any statically significant differences between the two sets of firms with regard to all of the ratios examined, suggesting that the U.S and the IN firms are similar to each other with respect to their managerial efficiencies of their operations.

Keywords: *Managerial efficiency, India, The United States, Profitability, Debt Management, Asset Management, Financial Ratios.*

I. INTRODUCTION

The accelerated GNP growth of India in recent years is one of the most significant events of the global economy. In 1947, when India gained its independence after a long struggle with the British government, it was marked by very low per capita income. At that time, It was generally agreed that the state must be in control of the economy and it should not be run by the capitalist sector. In other words, the Indian economy was patterned after the economy of the Soviet Union that was characterized by socialist practices, large public sectors, high import duties and insignificant private participation that has led to immense inefficiencies and prevalent corruption (Williamson, 2006, p.1).

As a result of adopting the Soviet economic pattern for the best part of forty years after its independence, the Indian economy experienced very slow growth. To bolster its economy, India followed free market principles and liberalized its economy to international trade. This action resulted in accelerated economic growth and enabled India to record the highest growth rates in the mid-2000s, and it emerged as one of the fastest-growing economies in the world.

The elements that gave rise to such an impressive economic growth in India include a massive rise in the size of the middle class consumer population, a large workforce encompassing skilled and non-skilled workers, good education standards and considerable foreign investments (Williamson, 2006, p.2).

Today, India is the ninth largest economy in the world by nominal GDP, seventeenth largest exporter and eleventh largest importer in the world. Economic growth rates are projected at around 7.5%-8% for the financial year 2011-2012 (Wikipedia, 2012).

Given the significant economic progress in India, numerous studies have investigated different aspects of the Indian economy (see for example, Williamson 2006, Kumar, Palit, and Singh 2007, and Kumar and Patibandla 2009). However, no study has examined the relative managerial efficiencies of the U.S. and IN firms. The

purpose of this study is to evaluate the relative managerial efficiencies of fourteen matched-pair American (U.S.) and Indian firms.

In this study, the notion of managerial efficiency is defined in terms of profitability, debt management, and asset management. Profitability is measured by return on assets, return on equity, and return of investment. Debt management is measured by long-term debt to equity and total debt to equity. Asset management is measured by total asset turnover, receivable turnover, and inventory turnover.

The following eight financial ratios are used in the analysis:

1. ROA: Return on Assets (net income/assets);
2. ROE: Return on Equity (net income/common equity);
3. ROI : Return on Investment (net income /investment);
4. LTDE: LT Debt to Equity
5. TDTE: Total Debt to Equity
6. TAT: Total Asset Turnover
7. RTO: Receivable Turnover
8. ITO: Inventory Turnover

II. THE LIMITATIONS OF THE STUDY AND THE SAMPLE SIZE

The problem of measurement in comparative analysis have been discussed by a number of researchers (Larry, 1968; Dunning, 1970, p.348). Measurement problems, as related to firm comparison, center around two main issues. First, the choice of industries, and second the kind of data. As for the first issue, ideally the two groups of firms should be similar with regard to product heterogeneity and size. They should also operate in a similar environment and market structure. However, the limitations of the sample size in most of the empirical studies call for restriction in choosing firms for comparison.

The second question has to do with accounting differences that exist between countries. These differences might lead to biases in the measurement of the ratios employed in the analysis. For example, measurement's problem could arise because the two countries may use different procedures for the valuation of income producing assets which affects income statements. In one country, marketable securities may be treated at the lower of cost or market value (LCM), whereas cost method could be utilized in another country. These differences might affect comparability of the two countries with regard to asset turnover, and profitability ratios.

In the case of our study, both the U.S. and India adhere to the strict application of historical cost and conservatism in their accounting practices. Revenue recognition between the two countries system is comparable. As a result, the comparison of financial ratios in this study should not be significantly affected. Following the most acceptable criteria set by empirical studies, each pair of firms chosen in this study consists of one U.S. firm and one IN firm producing similar product and having approximately the same size.

All the data for the study were compiled by the author from *Mergent on Line*. These include the most recent five-year time-series data for all the eight ratios that were available in 2011. Table 1 shows the industrial sectors and the number of matched pairs that were selected from each industry.

III. THE TESTING OF HYPOTHESIS

Paired comparison is used to compare the relative efficiencies U.S. and IN firms. Eight hypotheses are tested on the basis of ROA, ROE, ROI, LTDE, TDTE, TAT, RTO, and ITO. In all of these cases the null hypothesis states that there is no difference between U.S. and IN firms with regard to the ratio that is being compared. The alternative hypothesis explains that these ratios are different. Because matched pairs are used, an appropriate test is the Wilcoxon Matched-pairs Signed-ranked test. This test is ideal because it is a nonparametric test, not requiring a large sample size. The Wilcoxon test gives more weight to pairs that show a large difference than pairs indicating small ones. In this manner the Wilcoxon test is similar to the t-test but it deals with ordinal data. This test is one of the most powerful non-parametric tests. Even for small samples its power is about 95 percent of that of the t-tests (Asheghian, 1985; Mendenhall, McClarie, and Rammey 1978; Siegel 1956).

To conduct the Wilcoxon test, first the differences between each pair, with regard to the ratios that are being compared are computed. Then these differences are ranked on the basis of their absolute values. Next, the sum of the ranks of the positive and negative differences are used as the test statistics T- and T+, respectively. Finally, The minimum absolute T value in each table is chosen as the test statistic and is compared to the critical value of 21 given in the table of critical values for the Wilcoxon test.

The results of the test are shown in Tables two through nine. The values of the test statistic (T) in these tables indicate that all the null hypotheses cannot be rejected at the 5% level of significance.

IV. CONCLUDING REMARKS

To the extent that the data are not biased in the context of the limitations set in this study, the foregoing analysis suggests the following conclusions:

1. The absence of statically significant differences between the ROA, ROE, and ROI of the U.S. and IN firms suggests that they are similar to each other with respect to their managerial efficiency, as measured in terms of profitability.
2. The absence of statically significant differences between the LTDTE and TDTE of the U.S. and IN firms suggests that they are similar to each other, with respect to their managerial efficiency, as measured in terms of debt management.
3. The absence of statistically significant differences between The TATO, RTO, and ITO of U.S. firms as compared to their similar IN firms implies that U.S. firms and IN firms are similar with respect to their asset management.

Given the aforementioned results, it is no wonder that India has been forging ahead with such an impressive economic growth rate in recent years.

This study examined the comparative managerial efficiencies of the IN and the U.S. firms in terms of profitability, debt management and asset management, portraying the relative effectiveness of the executives of these firms in managing their finances. It would be helpful to compare production efficiencies of the IN with the U.S. firms to see if IN firms are as efficient as their counterparts in the U.S. in managing their production process. This would require the measurement of total factor productivity, capital productivity and labor productivity and could be the subject of further research in this area.

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TABLE 1
THE INDUSTRIAL SECTORS AND THE NUMBER OF MATCHED PAIRS OF FORM EACH SECTOR INCLUDED IN THIS STUDY

Industrial Sector	Number of pairs
Mining	1
Manufacturing	8
Transportation	1
Whole and Retail Trade	1
Finance	1
Services	2
Total number of firms	14

TABLE 2
THE WILCOXON TEST FOR THE COMPARISON OF THE ROA RATIOS OF U.S. AND THE IN INDUSTRIES

PAIR	$\sum_{i=1}^n ROA_{ki}^{U.S.}$	$\sum_{i=1}^n ROA_{ki}^{IN}$	DK	RD	PRS	NRS
1	34.32	59.87	-25.55	5		5
2	9.61	39.25	-29.64	2		2
3	11.73	13.13	-1.4	13		13
4	20.74	32.79	-12.05	7		7
5	23.58	18.13	5.45	12	12	
6	10.38	28.14	-17.76	6		6
7	40.24	81.45	-41.21	1		1
8	84.55	58.27	26.28	4	4	
9	9.95	37.14	-27.19	3		3
10	16.3	9.73	6.57	8		
11	0.5	6.61	-6.11	9		9
12	7.42	3.22	4.2	11	11	
13	9.38	0.18	9.2	10	10	
14	43.53	43.74	-0.21	14	14	14
					T+ =51	T- =60

$ROA_{ki}^{U.S.}$ = ROA of the kth U.S. firm in the ith year;

ROA_{ki}^{IN} = ROA of the kth IN firm in the ith year;

$i = 1 \dots 5; k = 1 \dots 14$

$DK = \sum_{i=1}^n ROA_{ki}^{U.S.} - \sum_{i=1}^n ROA_{ki}^{IN}$

RD = Rank of DK

PRS = Positive rank sum

NRS = Negative rank sum

TBLE 3

THE WILCOXON TEST FOR THE COMPARISON OF THE ROE RATIOS OF U.S. AND THE IN FIRMS

PAIR	$\sum_{i=1}^n ROE_{ki}^{U.S.}$	$\sum_{i=1}^n ROE_{ki}^{IN}$	DK	RD	PRS	NRS
1	63.85	109.87	-46.02	6		6
2	13.50	154.13	-140.63	1		1
3	15.47	77.14	-61.67	3		3
4	46.69	70.11	-23.42	9		9
5	57.64	63.90	-6.26	13		13
6	63.49	44.73	18.76	10	10	
7	74.35	129.17	-54.82	5		5
8	126.93	123.25	3.68	14	14	
9	26.68	93.83	-67.15	2		2
10	49.80	24.30	25.50	8	8	
11	0.98	16.49	-15.51	11		11
12	76.70	50.62	26.08	7	7	
13	14.54	0.42	14.12	12	12	
14	206.47	147.64	58.83	4	5	
					T+ = 56	T- = 50

$ROE_{ki}^{U.S.}$ = ROE of the kth U.S. firm in the ith year;

ROE_{ki}^{IN} = ROE of the kth IN firm in the ith year;

$i = 1...5; k = 1...14$

DK = $\sum_{i=1}^n ROE_{ki}^{U.S.} - \sum_{i=1}^n ROE_{ki}^{IN}$

RD = Rank of DK

PRD = Positive rank sum

NRS = Negative rank sum

TABLE 4

THE WILCOXON TEST FOR THE COMPARISON OF THE ROI RATIOS OF U.S. AND THE IN FIRMS

PAIR	$\sum_{i=1}^n ROI_{ki}^{U.S.}$	$\sum_{i=1}^n ROI_{ki}^{IN}$	DK	RD	PRS	NRS
1	75.00	129.24	-54.24	6		6
2	16.60	80.32	-63.72	2		2
3	19.10	46.48	-27.38	9		9
4	46.58	67.98	-21.40	11		11
5	46.32	61.35	-15.03	12		12
6	41.23	48.21	-6.98	13		13
7	54.52	136.49	-81.97	1		1
8	173.57	132.38	41.19	7	7	
9	30.50	92.63	-62.13	3		3
10	44.34	46.18	-1.84	14		14
11	4.31	33.75	-29.44	8		8
12	0.00	-61.05	61.05	4	4	
13	23.51	0.00	23.51	10	10	
14	166.59	110.07	56.52	5	5	
					T+ = 26	T- = 79

$ROI_{ki}^{U.S.}$ = ROI of the kth U.S. firm in the ith year;

ROI_{ki}^{IN} = ROI of the kth IN firm in the ith year; $i = 1...5; k = 1...14$

DK = $\sum_{i=1}^n ROI_{ki}^{U.S.} - \sum_{i=1}^n ROI_{ki}^{IN}$

RD = Rank of DK

PRD = Positive rank sum

NRS = Negative rank sum

TABLE 5
THE WILCOXON TEST FOR THE COMPARISON OF THE LTDTE RATIOS OF U.S. AND THE IN FIRMS

PAIR	$\sum_{i=1}^n LTDTE_{ki}^{U.S.}$	$\sum_{i=1}^n LTDTE_{ki}^{IN}$	DK	RD	PRS	NRS
1	1.34	1.34	0.00			
2	0.01	7.29	-7.28	8		8
3	0.37	12.30	-11.93	10		10
4	2.48	1.42	1.06	3	3	
5	3.47	6.88	-3.41	7		7
6	9.74	1.43	8.31	9	9	
7	1.25	0.65	0.60	2	2	
8	0.00	2.59	-2.59	6		6
9	3.82	2.40	1.42	4	4	
10	5.07	4.76	0.31	1	1	
11	0.42	2.01	-1.59	5		5
12	*	6.06				
13	*	0.3				
14	17.29	5.15	12.14	11	11	
					T+ = 30	T- = 36

*Data not available

$LTDTE_{ki}^{U.S.}$ = LTDTE of the kth U.S. firm in the ith year;

$LTDTE_{ki}^{IN}$ = LTDTE of the kth IN firm in the ith year;

$i = 1 \dots 5$; $k = 1 \dots 14$

$DK = \sum_{i=1}^n LTDTE_{ki}^{U.S.} - \sum_{i=1}^n LTDTE_{ki}^{IN}$

RD = Rank of DK

PRD = Positive rank sum

NRS = Negative rank sum

TABLE 6
THE WILCOXON TEST FOR THE COMPARISON OF THE TDTE RATIOS OF U.S. AND THE IN FIRMS

PAIR	$\sum_{i=1}^n TDTE_{ki}^{U.S.}$	$\sum_{i=1}^n TDTE_{ki}^{IN}$	DK	RD	PRS	NRS
1	1.34	1.34	0			
2	0.01	7.29	-7.28	9		9
3	3.19	12.3	-9.11	11		11
4	2.81	1.42	1.39	4	4	
5	3.72	6.88	-3.16	8		8
6	9.78	1.43	8.35	10	10	
7	1.65	0.65	1.00	3	3	
8	0.12	2.59	-2.47	7		7
9	4.71	2.40	2.31	6	6	
10	5.63	4.76	0.87	2	2	
11	1.25	2.01	-0.76	1		1
12	*	6.06				
13	0.23	2.03	-1.80	5		5
14	21.02	5.15	15.87	12	12	
					T+ = 37	T- = 41

* Data not available

$TDTE_{ki}^{U.S.}$ = TDTE of the kth U.S. firm in the ith year;

$TDTE_{ki}^{IN}$ = TDTE of the kth IN firm in the ith year;

$i = 1 \dots 5$; $k = 1 \dots 14$

$DK = \sum_{i=1}^n TDTE_{ki}^{U.S.} - \sum_{i=1}^n TDTE_{ki}^{IN}$

RD = Rank of DK

PRD = Positive rank sum

NRS = Negative rank sum

TABLE 7
THE WILCOXON TEST FOR THE COMPARISON OF THE TATO RATIOS OF U.S. AND THE IN FIRMS

PAIR	$\sum_{i=1}^n TATO_{ki}^{U.S.}$	$\sum_{i=1}^n TATO_{ki}^{IN}$	DK	RD	PRS	NRS
1	6.97	4.52	2.45	7	7	
2	5.89	8.12	-2.23	6		6
3	2.10	9.43	-7.33	12		12
4	3.54	4.43	-0.89	4		4
5	2.99	13.18	-10.19	13		13
6	15.05	4.42	10.63	14	14	
7	1.91	4.59	-2.68	8		8
8	8.18	7.41	0.77	3		
9	5.12	6.56	-1.44			5
10	2.32	2.09	0.23	1	1	
11	7.87	3.84	4.03	10	10	
12	0.38	0.04	0.34	2	2	
13	7.75	3.00	4.75	11	11	
14	8.25	5.02	3.23	9	9	
					T+ =54	T- =48

$TATO_{ki}^{U.S.}$ = TDTE of the kth U.S. firm in the ith year;

$TATO_{ki}^{IN}$ = LTDTE of the kth IN firm in the ith year;

$i = 1 \dots 5$; $k = 1 \dots 14$

$DK = \sum_{i=1}^n TATO_{ki}^{U.S.} - \sum_{i=1}^n TATO_{ki}^{IN}$

RD = Rank of DK

PRD = Positive rank sum

NRS = Negative rank sum

TABLE 8
THE WILCOXON TEST FOR THE COMPARISON OF THE RTO RATIOS OF U.S. AND THE IN FIRMS

PAIR	$\sum_{i=1}^n RTO_{ki}^{U.S.}$	$\sum_{i=1}^n RTO_{ki}^{IN}$	DK	RD	PRS	NRS
1	28.93	77.15	-48.22	10		10
2	42.37	26.29	16.08	5	5	
3	7.35	33.40	-26.05	7		7
4	19.23	21.06	-1.83	1		1
5	26.97	338.19	-311.22	13		13
6	117.55	53.40	64.15	11	11	
7	24.08	19.02	5.06	2	2	
8	47.64	29.77	17.87	6	6	
9	31.48	60.99	-29.51	8		8
10	51.48	19.12	32.36	9		9
11	240.80	23.40	217.40	12		12
12		4.00				
13	21.06	10.27	10.79	4	4	
14	27.07	19.44	7.63	3	3	
	*	0.24				
					T+ = 31	T- = 60

* Data not available

$RTO_{ki}^{U.S.}$ = RTO of the kth U.S. firm in the ith year;

RTO_{ki}^{IN} = RTO of the kth IN firm in the ith year;

$i = 1...5; k = 1...14$

$DK = \sum_{i=1}^n RTO_{ki}^{U.S.} - \sum_{i=1}^n RTO_{ki}^{IN}$

RD = Rank of DK

PRD = Positive rank sum

NRS = Negative rank sum

TABLE 9
THE WILCOXON TEST FOR THE COMPARISON OF THE ITO RATIOS OF U.S. AND THE IN FIRMS

PAIR	$\sum_{i=1}^n ITO_{ki}^{U.S.}$	$\sum_{i=1}^n ITO_{ki}^{IN}$	DK	RD	PRS	NRS
1	1164.39	70.69	1093.7	1	13	
2	25.77	8.95	16.82	2	5	
3	24.08	58.05	-33.97	3		8
4	15.73	6.42	9.31	4	3	
5	12.01	49.5	-37.49	5		9
6	89.31	19.61	69.7	6	11	
7	7.53	8.66	-1.13	7		1
8	13.6	31.37	-17.77	8		6
9	24	30.95	-6.95	9		2
10	54.45	10.6	43.85	10		10
11	19.28	29.51	-10.23	11		4
12	164.72	559	-394.28	12		12
13	58.51	37.31	21.2	13	7	
14						
					T+ =39	T- =52

* Data not available

$ITO_{ki}^{U.S.}$ = ITO of the kth U.S. firm in the ith year;

ITO_{ki}^{IN} = ITO of the kth IN firm in the ith year;

i = 1...5; k = 1...14

DK = $\sum_{i=1}^n ITO_{ki}^{U.S.} - \sum_{i=1}^n ITO_{ki}^{IN}$

RD = Rank of DK

PRD = Positive rank sum

NRS = Negative rank sum