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TECHNICAL, PURE TECHNICAL AND SCALE EFFICIENCY ANALYSIS OF INSURANCE COMPANIES OF PAKISTAN

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ABSTRACT: *We examine the technical, pure technical, scale and mix efficiencies for a sample of 25 general insurance companies of Pakistan over a period of 2002-2007, using CCR and BCC models of nonparametric frontier approach, data envelopment analysis (DEA). The objective is to provide new insights in value-based technical efficiency of Pakistani general insurance companies. The results show that most of the insurance companies are technical, scale and mix inefficient and the major cause of this inefficiency is excess in labor and shortfall in claims-settled amount.*

KEYWORDS*:* Scale efficiency, Insurance, Technical, Pure technical

INTRODUCTION

An efficient financial system can perform an efficient intermediation function by channelizing funds from savers to borrowers and hence contribute in productivity and economic growth. Similarly, a well-developed and efficiently working insurance sector can play an important role in the economic and social development of a country by reducing uncertainty for economic agents, and pooling long-term financial resources. The insurance industry also contributes in the development of other financial institutions and markets, thus indirectly facilitates economics progress in a country. During the last decade, the insurance sector of Pakistan has gone through a series of changes due to information technology, government reforms in financial sector, global impact on financial services and economic development. As in November, 2007 there were 637 companies which were listed on Karachi Stock Exchange of Pakistan with a total market capitalization of Rs. 4,121 (66 billion US$), out of this financial sector constitutes 41% of the total market capitalization. Listed insurance sector on Karachi Stock Exchange in terms of companies is 4.4%. Share of listed insurance sector on total listed companies is 1.41%. Out of 637 listed companies, 29 relate to insurance sector.

Recent years have seen a profound attention in efficiency measurements. Traditionally, efficiency has been analyzed by simple ratios such as labor productivity (output per unit of labor employed) or capital intensification (capital per unit of labor). In insurance, efficiency is often measured by expense and claim ratios, return on invested assets and solvency margin etc. but there are problems associated with these ratios. As Wang and Huang (2007) have argued that the standard performance ratios are usually confounded with other effects, Frontier efficiency measures, on the contrary, exploit mathematical programming and econometric techniques to assess a DMU's performance, which is purged of the impacts of market prices and other exogenous components affecting actual performance. In their view frontier efficiency is superior to and advantageous over other simple financial indicators of performance. So there is an increasing interest in the "frontier" analysis of economic efficiency as it allocates best available weights to each input and output also it determine the best practice DMU to benchmark it for other DMUs. Many books and articles have been written on the efficiency methodologies and their implications. These methodologies are widely used for the efficiency measurements of banks, insurance companies, mutual funds, universities, government departments, and hospitals but insurance sector, in particular, has seen a rapid growth in application of these methodologies. Tavares G. (2002) has created a bibliography of data envelopment analysis from 1978 to 2001 containing 3202 publications data.

Two basic methodologies are developed for measuring efficiency i.e., mathematical or non-parametric and econometric or parametric. Both methodologies measure the best practice frontier by computing the relative efficiency of decision making units (DMUs). Econometric approach is stochastic in nature as it requires some functional form or parametric expression for measuring efficiency frontiers. A DMU not on the frontier is considered inefficient. This inefficiency may occur due to its actual inefficiency or due to random shocks or some error in the data. So an error term is hypothesized to separate the inefficiency component from random error. While mathematical approach does not require any functional form to measure relative efficiencies, also they are not stochastic in nature i.e., they do not require specification of error term and the DMUs which do not lie on efficiency frontiers are considered as inefficient.

There are advocates of both parametric as well as non-parametric approaches for determining efficiency and efficient frontier. Some researchers prefer econometric while others prefer mathematical approach. Cummins and Zi (1998), and Huang and Wang (2002), suggest us of multiple techniques to be more informative. Greene (1993) has presented the advantages and disadvantages of both methodologies. A detailed discussion of parametric and non-parametric methods is provided by Coelli, Rao and Battese (1998).

There are numerous studies on technical efficiency of insurance companies of other countries but there is no such study, to the best of our knowledge, on insurance sector of Pakistan This paper uses data envelopment analysis to measure the technical, pure technical and scale efficiency of general insurance companies of Pakistan. Thus, this study is an attempt to fill the demanding gap in literature. We hope that this paper will provide new insights in the efficiency evaluations and identify the factors which are producing inefficiencies. It is also hoped that this study will be beneficial both for managers and regulators of insurance companies in Pakistan.

This paper is organized as follows: section 2 provides contextualization and data description, section 3 presents methodology and analysis, section 4 provides discussions and finding, section 5 presents conclusions and policy implications, and section 6 presents references.

CONTEXTUALIZATION AND DATA DESCRIPTION

Farrell (1957) introduced the concept of efficiency frontier. Efficiency is the concern that an insurer produces a given set of outputs (i.e., premiums) using a particular set of inputs (labor expenses). An insurer is said to be technical efficient if it is unable to increase/decrease its output level without some proportional increase/decrease in its input level, provided a given state of production technology in the industry.

There are many reasons of technical inefficiency. If a company is operating at an inappropriate size (either too small or too large) it is termed as scale inefficient. While, a company using its inputs and outputs in wrong proportions is termed as mix inefficient. Cummins & Santomero (1999) and Cummins, Weiss & Zi (1999) have discussed the potential sources of inefficiency in detail.

As most of outputs of service firms as banks and insurance companies are tangible, so it is difficult to measure so a wise approach is to identify the services provided by such firms and find proxies for these services. Following the approach in most of the recent literature on financial institutions, we have adopted value-added approach to identify the important outputs. There is an agreement in literature with respect to the choice of inputs; we have thus chosen labor, investment, and equity capital as inputs. Insurance companies provide three main services – risk pooling/ bearing, financial services, and intermediation function. Yuengert (1993) considers value of real incurred losses which are defined as current losses paid plus addition to reserves as a good proxy for risk-pooling/bearing function. Investment income is taken as proxy for intermediation function. Majority of studies have used premiums as output. Hence, our outputs are net premium, investment income and claims settled. To make the monetary values directly comparable, we have deflated each value by GDP deflator to base year 2004.

The data has been obtained from the Insurance Association of Pakistan (IAP). It contains information on 25 non-life insurance companies for four years covering the period 2004-2007. Only those companies are included which have non-negative data values for all the inputs and outputs.

METHODOLOGY AND ANALYSIS

The study has used two forms of DEA model i.e., input-oriented CCR and BCC models. CCR model was developed by Charnes, Cooper, and Rhodes (1978) based on constant return to scale assumption while BCC is based on variable return to scale assumption. Efficiency estimates are obtained by using DEA solver software of Cooper, Seiford, and Tone (2007). Three different aspects of efficiency are evaluated defined by Diacon et al. (2002) as follows:

- Pure Technical Efficiency: this measures the extent to which a firm can decrease its inputs (in fixed proportion) while still remaining within the VRS frontier. Thus technical efficiency measures the DMU's overall success at utilizing its inputs.
- Scale Efficiency: this reflects the extent to which a firm projected to the VRS efficiency frontier can further decrease its inputs (in fixed proportions) while still remaining within the constant return to scale frontier. Thus scale efficiency measures the extent to which a firm can reduce inputs by moving to a part of the frontier with more beneficial returns to scale characteristics.
- Mix Efficiency: this measures the extent to which a firm projected onto the VRS frontier can further decrease some inputs without decreasing outputs (or increase output without increasing inputs). Thus mix efficiency measures the extent to which a DMU can benefit from a change in the balance of its inputs and outputs.

The choice of DEA is due to following three reasons: (1) it is non-parametric and hence does not require functional form in advance; (2) it can handle small sample size; (3) and it can decompose technical efficiency (TE) into pure technical efficiency (PTE) and scale efficiency (SE) where TE = PTE * SE. A firm can achieve PTE by moving to variable return to scale frontier (VRS) frontier formed by BBC model. On this frontier a firm either has increasing return to scale (IRS), constant return to scale (CRS), or decreasing return to scale (DRS). If a firm is operating with either IRS or

DRS, it can further improve its technical efficiency by operating with CRS. If PTE=TE for a firm then it is operating with CRS and is scale efficient i.e., have SE=1. Scale efficiency can also be determined as: SE = $\theta_{CRS}/\theta_{VRS}$ where θ_{CRS} and θ_{VRS} are efficiency scores under CRS and VRS respectively.

CCR Model

Let DMU_j to be evaluated be designated as DMU_o where o ranges from 1,2,…..,n. We solve the following fractional programming problem to obtain values for the input "weight" (v_i) (i=1,…,m) and the output "weights" (u_r) (r=1,…,s) as variables.

$$(F.P_o) \qquad \max_{u,v} \theta = \frac{v_1 y_{10} + v_2 y_{20} + \ldots + u_s y_{so}}{v_1 x_{10} + v_2 x_{20} + \ldots + v_s x_{so}}$$

Subject to $$\frac{u_1 y_{1j} + \ldots + v_s y_{sj}}{u_1 x_{1j} + \ldots + v_s x_{sj}} \leq 1 \left(j = 1, \ldots, n \right)$$

$$v_1, v_2, \ldots, v_m \geq 0.$$

$$v_1, v_2, \ldots, v_s \geq 0.$$

The above fractional program (FP_o) can be replaced by the following linear program (LP_o),

$$(F.P_o) \qquad \max_{u,v} \theta = v_1 y_{10} + \ldots + u_s y_{so}$$

Subject to $$v_1 x_{10} + \ldots + v_m x_{mo} = 1$$

$$\mu_1 y_{1j} + \ldots + \mu_s y_{sj} \leq v_1 x_{1j} + \ldots + v_m x_{mj}$$

$$\left(j = 1, \ldots, n \right)$$

$$v_1, v_2, \ldots, v_m \geq 0.$$

$$\mu_1, \mu_2, \ldots, \mu_s \geq 0.$$

DMU_o is CCR-efficient if $\theta^*=1$ and there exists at least one optimal (v^*,u^*), with $v^*>0$ and $u^*>0$, otherwise, DMU_o is CCR-inefficient.

Arranging the data sets in matrices X = (x_j) and Y = (y_j), we can define the production possibility set P by

$P = \{ (x,y) / x \geq X\lambda,\ y \leq Y\lambda,\ \lambda \geq 0 \}$

Where λ is a semi positive vector in R^n.

Now the linear program in multiplier form is:

$$(LP_o)\max_{v,u} \quad uy_o$$

Subject to $\quad vx_o = 1$

$$-vX + vY \leq 0$$

$$v \geq 0, u \geq 0.$$

$$(DLP_o)\min_{\theta,\lambda} 0$$

Subject to $\quad \theta x_o - X\lambda \geq 0$

$$Y\lambda \geq y_o$$

$$\lambda \geq 0.$$

The dual problem of (LP_o) is expressed with a real variable θ and a non-negative vector $\lambda = (\lambda_1, \lambda_2,\ldots,\lambda_n)$ of variables in envelopment form is as follows:

$$(DLP_o)\min_{\theta,\lambda} 0$$

Subject to $\quad \theta x_o - X\lambda \geq 0$

$$Y\lambda \geq y_o$$

$$\lambda \geq 0.$$

DLP_o has a feasible solution $\theta = 1, \lambda_o = 1, \lambda_j = 0 \; (j \neq 0)$. We define the input excesses $s^- \varepsilon R^m$ and the output shortfalls $s^+ \varepsilon R^s$ and identify them as "slack" vectors by:

$s^- = \theta x_o - X\lambda, \;\; s^+ = Y\lambda - y_o$,

with $s^- \geq 0, s^+ \geq 0$ for any feasible solution (θ,λ) of (DLP_o)

Now a DMU_o is called CCR if its $\theta^* = 1$ and all slacks are zero ($s^{-*} = 0, s^{+*} = 0$)

BCC Model

The input-oriented BCC model evaluates the efficiency of DMU_o (o = 1,2,….,n) by solving the following (envelopment form) linear program:

$(BCC_o) \qquad \min_{\theta_B, \lambda} \ \theta_B$

Subject to $\theta_B x_o - X\lambda \geq 0$

$$Y\lambda \geq y_o$$

$$e\lambda = 1$$

$$\lambda \geq 0,$$

Where θ_B is a scalar.

The dual multiplier form of this linear program (BCC_o) is expressed as:

$$\max_{v,u,u_o} \ z = uy_o - u_o$$

Subject to $vx_o = 1$

$$-vX + uY - u_0 e \leq 0$$

$$v \geq 0, u \geq 0, u_o \text{ free in sign,}$$

Where v and u are vectors and z and u_o are scalars and the latter, being "free in sign" may be positive or negative (or zero). The equivalent BCC fractional program is obtained from the dual program as:

$$\max \frac{uy_o - u_o}{vx_o}$$

Subject to $\frac{uy_j - v_0}{vx_j} \leq 1 (j = 1, \ldots, n)$

$$v \geq 0, u \geq 0, u_o \text{ free.}$$

If an optimal solution ($\theta^*_B, \lambda^*, s^{-*}, s^{+*}$) obtained in this two-phase process for (BCC_o) satisfies $\theta^* = 1$ and has no slacks ($s^{-*} = 0, s^{+*} = 0$), then the DMU_o is called BCC-efficient, otherwise it is BCC-inefficient.

DISCUSSION OF FINDINGS

Table 1 shows the results of technical efficiencies and mixed efficiencies of insurance companies by CCR and BCC models for the year 2007. According to CCR model, 9 out of 25 companies are technical efficient scoring 1 meaning that they exist on the efficient frontier and there is no room for improvement in their output without increasing the inputs with the same proportion. Also these

9 companies are mix efficient as their slacks in inputs and outputs are zero. Remaining 16 companies are both technical as well as mix inefficient. Score column shows their technical efficiency score and rank column shows their respective ranking according to their technical efficiency. The row named projection shows the percentage decrease in inputs and percentage increase in outputs to make a DMU technical efficient. Capital insurance has the minimum technical efficiency score i.e., 0.21. It needs to decrease its labor, investment and equity level upto 87.56%, 78.61%, and 78.61% respectively, while increasing its output claim settled to 494.62% to be on efficient frontier. Once an inefficient DMU becomes technical efficient by reducing its inputs levels and increasing its output level as given in projection then its to decrease excess input slacks and increase shortfall in output slacks to eliminate mix inefficiency. Most of the insurance companies are inefficient due to excess inputs especially labor and low level of claim-settlement activity. On average, the excess in labor, investment and equity capital in CCR is 35.25%, 29.14% and 26.46% respectively. Average shortfall in net premium, investment income and claims settled is 0%, 33.48% and 62.06% respectively.

BCC results for the same year shows 14 insurance companies to be technical efficient out of 25 DMUs. 5 companies are those who were CCR inefficient but become BCC efficient, which is due to convexity condition in the BCC model. Capital insurance which has the lowest score in CCR now become BCC efficient, but still it has mix inefficiency due to slack in output claims settled. If this output is increased by this minor shortfall (0.0817), then it will become mix efficient as well. Excel insurance is other DMU which is technical efficient but is mix inefficient due to shortfall in two of its outputs i.e., net premiums and claims settled, but these slacks are also not significant . The average values of excess in labor, investment, and equity capital is 19.98%, 16.53% and 15.47% respectively, and average value of shortfall in net premiums, investment income and claims settled is 2.90%, 49.95% and 39.41% respectively.

Table 2 shows the CCR and BCC results for the year 2006. 7 out of 25 companies are fully CCR efficient i.e., technical as well as mix efficient. Capital insurance, here as well, has the lowest technical efficiency (0.0925). It needs to reduce its labor, investment and equity capital by 90.75%, 92.63% and 90.75% respectively to become technical efficient. Also it needs to remove excess slack in investment level and increase shortfall in claims settled to become fully efficient. BCC results show that 15 companies are technical efficient. Out of these 15 companies, 4 are mix inefficient but their slackness is negligible. Average values of excess in inputs in CCR for labor, investment and equity capital are 32.78%, 30.59%, and 29.54%, while in BCC are 14.25%, 12.90%, and 9.25% respectively. Average values of shortfall in outputs net premium, investment income and claims settled in CCR are 5.94%, 26.87%, and 43.87%, while in BCC are 0.49%, 43.56%, and 23.84% respectively.

Table 3 describes the efficiency results for the year 2005. 10 firms are CCR efficient, while 16 firms are BCC efficient. Projected decrease in inputs and increase in outputs is required for the firm to be technical efficient, while slacks should be removed to eliminate mix inefficiency. Average values of excess inputs labor, investment, and equity capital in CCR are 24.58%, 23.86%, and 20.22%, while in BCC are 9.36%, 8.72%, and 5.45% respectively. Average values of output shortfall in net premium, investment income and claims settles in CCR are 18.22%, 9.55%, and 70%, while in BCC are 2%, 45%, and 24% respectively.

Table 4 shows efficiency results for the year 2004. CCR results shows 13 firms to be technical efficient, while 15 firms are BCC efficient. Alpha insurance is the least efficient i.e., its efficiency score is 0.34, needs 66.26% decrease in all of its inputs and 22% increase in claims settled to be technically efficient, and further addition of shortfall of 5,914 slack in its claims settled amount will remove its mix inefficiency. Average values of excess inputs of labor, investment, and equity capital in CCR are 18.58%, 19.34%, 16.64%, while in BCC are 14.53%, 19.47%, and 13.09% respectively. Average values of shortfall in outputs net premium, investment income, and claims settled in CCR are 42.58%, 5.04%, and 57.26% and in BCC are 6.54%, 5.11%, and 16.62% respectively.

If we analyze the CCR efficiency of individual firms, we see that there is unusual increase in efficiency of Adamjee Insurance for the year 2005 i.e., 1. One reason for improvement is the increase in investment income. In 2007 its efficiency is 0.87 and one potential reason for it is too much increase in its equity capital. Alpha Insurance has ups and downs in its efficiency scores. It has its highest score in 2007 i.e., 0.90. Two potential reasons are decrease in its labor and increase in investment income. Asia Insurance has least efficiency scores in years 2005 and 2006. The suggested remedy is to decrease its inputs levels in the two years. Askari Insurance has improved from year 2004 to 2007, but it still can improve further by decreasing its inputs usage. Atlas Insurance showed improvement in 2005 but in remaining years its efficiency is 0.5 on average. The suggestion is to decrease its three inputs levels and to increase its claims settlement ratio. Capital Insurance has a continuously downward trend in efficiency with least efficiency in the year 2006 and highest in 2004. The reasons for inefficiency are excess investment, equity capital and shortfall in claim settled amount. Central Insurance is throughout efficient except for the year 2006. The reasons are increase in equity and labor and decrease in premium amount. It has raised its equity base almost double in the year 2006. Century Insurance, while remaining efficient in the years 2004 and 2005, went into inefficiency region in the following years 2006 and 2007. The reasons are increase in the three inputs labor, equity and investment. Crescent Star has improved its efficiency in the year 2007 due to decrease in its investment volume and increase in its claims settled amount. East West Insurance has the least efficiency in the year 2006 due to excess use of inputs and low level of claims settled amount. EFU General Insurance remained inefficient in the year 2004 and is efficient in the following years. Although it has increase in all of its inputs but the proportional increase in its outputs is greater than increase in inputs. Excel Insurance while remaining efficient in the year 2004 became inefficient in the following years. To gain efficiency it should decrease its investment and equity level while increasing claims settled amount. Habib Insurance has lost efficiency in the year 2007. The reason is clear from its increase level of labor, investment and equity. IGI is close to the efficient frontier but is inconsistent in maintaining its efficiency position. The reason for inefficiency in 2007 are increased level of investment and equity. New Jubilee Insurance needs to decrease its equity and investment to be efficient. Pakistan General Insurance is one of the most inefficient firms in the industry. It is inefficient throughout with maximum efficiency of 0.43 in the year 2004. It needs to decrease all of its inputs and increase its investment income and claims settled amount. PICIC after remaining inefficient in the year 2004, maintained its efficient position in the following years. Premier Insurance remained inefficient in the year 2007 due to increase in investment and equity and decrease in claims settled amount. Reliance Insurance is also one of the poor performers in the industry. It should also decrease all of its inputs. Security General Insurance has improved its efficiency after 2004. Silver Star Insurance while remaining efficient in the year 2004 lost its position in the following years due to increase in equity and investment and decrease in claims settled amount. United Insurance has also inconsistency in its efficiency. New Hampshire, Shaheen and Universal Insurance are the efficiency benchmarks for others. These three firms have remained efficient throughout the four years.

Table 5 summarizes the results of technical efficiency (TE), pure technical efficiency (PTE), and scale efficiency (SE) values for each year from 2004-2007, and average values. The average values show that 36% firms are pure technically efficient, while only 12% firms are both technical and scale efficient.

Table 6 shows the statistics on data and correlation among the inputs and output values. There is significant correlation among inputs and outputs.

The average CCR efficiency scores for four years show that there are only three insurance companies which are technically efficient throughout, and can be used as a benchmark for other companies. These companies are: New Hampshire, Shaheen, and Universal Insurace. Central Insurance and EFU General Insurance are inefficient in only one year and are close to be efficient and can also be used as benchmark for efficiency.

BCC model put more DMUs on efficient frontier than CCR model. According to BCC model, nine companies are designated as efficient, these are: Adamjee, Asia, Capital, Central, EFU General, Excel, New Hampshire, Shaheen, and Universal Insurance Companies. These companies can be used as benchmark for efficiency.

CONCLUSIONS AND POLICY IMPLICATIONS

This paper has tried to evaluate efficiency of insurance firms from a new and broad perspective. We presented recent studies on efficiency of insurance companies and then applied it, for the very first time, on Pakistani general insurance industry. Traditionally, isolated ratios were used to evaluate efficiency in Pakistan. This paper gives new insights in the factors causing inefficiency and suggestion for their removal so that firms might gain total technical efficiency. The efficiency analysis gives the benchmark efficient firms for others to copy and to become efficient as well. The efficiency level in Pakistani insurance firms is too low. Only 12% firms are CCR-efficient, while 36% firms are BCC-efficient. Hence, 36% firms are PTE and only 12% firms are scale and technically efficient. The major cause of inefficiency is due to excess in labor and shortfall in claims settled, so it is recommended that insurance companies should reduce labor and increase claims-settlement ratio. One limitation of this research is that the level of firms' equity capital cannot be decreased below the Rs. 100 million, as it is the minimum required level by Securities and Exchange Commission of Pakistan.

One of the interesting topics for future research is to compare these efficiency results with the other traditional efficiency ratios prevalent in insurance industry and to find actual standing and strength of insurance companies shown by their EPS and P/E ratios. Also the robustness of these results can be compared with the efficiency results of other efficiency techniques i.e., stochastic frontier analysis. Measuring cost efficiency and economies of scale and scope is another topic to be researched. One shortcoming of DEA model is that it does not rank among the efficient firms i.e., it treats all efficient firms equally efficient. There are methods to rank among the efficient firms and it is also another interesting topic for future research.

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TABLE 5

No.	DMU	2004			2005			2006			2007			AVERAGE		
		TE	PTE	SE	TE	PTE	SE	TE	PTE	SE	TE	PTE	SE	TE	PTE	SE
1	Adamjee Insurance	0.87	1.00	0.87	1.00	1.00	1.00	0.90	1.00	0.90	0.87	1.00	0.87	0.91	1.00	0.91
2	Alpha Insurance	0.34	0.34	1.00	0.62	1.00	0.62	0.37	0.72	0.51	0.90	0.93	0.97	0.56	0.75	0.77
3	Asia Insurance	1.00	1.00	1.00	0.65	1.00	0.65	0.58	1.00	0.58	1.00	1.00	1.00	0.81	1.00	0.81
4	Askari Gen. Ins.	0.59	0.59	1.00	0.72	0.81	0.89	0.75	0.88	0.86	0.79	1.00	0.79	0.71	0.82	0.88
5	Atlas Insurance	0.67	0.67	0.99	1.00	1.00	1.00	0.56	0.63	0.90	0.56	0.60	0.94	0.70	0.72	0.96
6	Capital Insurance	1.00	1.00	1.00	0.42	1.00	0.42	0.09	1.00	0.09	0.21	1.00	0.21	0.43	1.00	0.43
7	Central Insurance	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	0.85	1.00	1.00	1.00	0.96	1.00	0.96
8	Century Insurance	1.00	1.00	1.00	1.00	1.00	1.00	0.53	0.74	0.73	0.55	0.69	0.79	0.77	0.86	0.88
9	Crescent Star	0.71	0.71	1.00	0.64	0.89	0.71	0.62	1.00	0.63	1.00	1.00	1.00	0.74	0.90	0.83
10	East West	1.00	1.00	1.00	0.81	0.86	0.94	0.46	0.60	0.78	0.76	0.76	1.00	0.76	0.80	0.93
11	EFU Gen. Ins. Ltd.	0.84	1.00	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.96	1.00	0.96
12	Excel Insurance	1.00	1.00	1.00	0.51	1.00	0.51	0.37	1.00	0.37	0.38	1.00	0.38	0.57	1.00	0.57
13	Habib Insurance	0.96	0.96	1.00	0.75	0.82	0.92	1.00	1.00	1.00	0.45	0.45	0.98	0.79	0.81	0.98
14	IGI	1.00	1.00	1.00	0.74	1.00	0.74	1.00	1.00	1.00	0.79	0.91	0.87	0.88	0.98	0.90
15	New Hampshire Ins.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	New Jubilee Ins.	1.00	1.00	1.00	0.87	0.94	0.92	0.88	1.00	0.88	0.72	1.00	0.72	0.87	0.99	0.88
17	Pakistan Gen. Ins.	0.43	0.53	0.81	0.29	0.94	0.31	0.23	0.72	0.32	0.25	0.52	0.49	0.30	0.68	0.48
18	PICIC	0.63	0.85	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.96	0.93
19	Premier Ins.	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.93	0.97	0.38	0.41	0.93	0.82	0.84	0.97
20	Reliance Insurance	0.63	0.65	0.97	0.56	0.65	0.85	0.58	0.72	0.81	0.59	0.59	1.00	0.59	0.65	0.91
21	Security Gen.	0.64	0.66	0.97	0.91	1.00	0.91	0.86	1.00	0.86	1.00	1.00	1.00	0.85	0.91	0.94
22	Shaheen Insurance	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
23	Silver Star	1.00	1.00	1.00	0.54	1.00	0.54	0.60	1.00	0.60	0.54	0.88	0.62	0.67	0.97	0.69
24	United Ins.	0.75	0.77	0.97	1.00	1.00	1.00	0.75	0.76	1.00	0.97	0.97	1.00	0.87	0.88	0.99
25	Universal Ins.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00