Operational Efficiency Performance Modelling of Malaysia Manufacturing Industry

[1]Fader Abdullah, [2]Ku Ruhana Ku-Mahamud, [1]Ahmad Ismail, [2]Maznah Mat Kasim
[1]Faculty of Business Management, Universiti Teknologi MARA, 02600 Arau, Perlis.
[2]School of Computing, College of Arts and Sciences, Universiti Utara Malaysia, 06010 Sintok, Kedah.
Corresponding e-mail: fader@perlis.uitm.edu.my

Abstract

This paper presents an alternative measurement performance system for public listed manufacturing based industry in Malaysia. An operational efficiency performance model for the production of each company was developed using the non-parametric approach, specifically the data envelopment analysis. The performance has been measured through the use of output-oriented based on CCR and BCC models. Data from 80 consumer and industrial product companies were used. The data consists of six inputs and two outputs obtained from financial statement for the year 2010. Experimental result was able to identify efficient and inefficient companies where half of the companies were considered almost efficient under the BCC model. However, only one third of the companies were near efficient when out orientation is performed under the CCR model.

Keywords: *Data envelopment analysis, efficiency measurement model, non-parametric, manufacturing industry*

1. INTRODUCTION

Malaysia's journey towards achieving high income economy has gained momentum as reflected by a remarkable leap in its competitiveness ranking from 18th position in 2009 to 10th position in 2010. According to productivity report 2010/2011, Malaysia's productivity performance grew by 5.8% to RM51,591 in 2010. The productivity growth was driven mainly by both the manufacturing (9.4%) and services sectors (4.7%). As anticipated, the manufacturing sector recorded a much higher growth than the national growth of 5.8% caused mainly by improved industrial production. In 2010, the manufacturing sector registered a growth of 11.4% with 27.7% contribution to gross domestic product, second after the services sector. The sector also recorded significant increase in the manufacturing index from 101.0 in 2009 to 112.2 in 2010, registering a growth of 11.1%. The efficiency and innovation indicators of the World Competitiveness Report are instructive. Out of 133 countries, Malaysia currently ranks 25th on indicators of efficiency and 24th on indicators of innovation.

The prevailing consensus in modern growth theory is that the fundamental long-run driver of growth is productivity improvement. Malaysia, as an upper-middle income country, has passed the stage where the mere accumulation of production factors triggers rapid growth. It has entered the stage where growth hinges on the country's ability to put its factors of production to good use. Efficiency enablers tackle the inefficiencies that arise in the way the factors of production are combined and employed, the result being that production falls short of the production frontier. While innovation enablers are all about facilitating innovation that moves the production frontier in new directions.

The competitiveness of a country is from improvement of productivity and efficiency of its enterprises. Therefore evaluation and measurement of companies efficiency performances is important not only for managers but for investors as well as the government to ensure resources are fully utilized and to determine best practices as a way to improve performance and productivity (Baros, 2004). The current level global economic and competition pressures, forcing manufacturing organizations to reengineering improvement of it efficiency performance for them to maintain their competitive advantage over its rival and to meet future world challenges. Productivity and efficiency management now become important agenda in their management practices.

2. LITERATURE REVIEW

Performance measurement is important for organizations to make good decisions. Performance measurement systems enable decision makers to diagnose weak performance, identify and address root causes, and track improvement. Efficiency measurement is one of the main components in measuring organizational performance. The theory of efficiency is related to the association between resources used and results achieved. The optimization of resources can amplify the efficiency and competitiveness of the organization. Parametric and non-parametric approaches are among those that can be used to measure performance. Parametric approaches specify functional form and take residual term into account in the analysis. Non-parametric approaches are less structured in terms of the specification of the best practice frontier and assume no random error Huth and Pokorna (2004). The main difference between these approaches is the distribution of data. Parametric approaches involve normality of the data distribution while non-parametric approaches do not. Non-parametric methods have many advantages over parametric ones. For instance non-parametric approaches are simple and less affected by outliers. These approaches do not require information about the distribution and the variance of the data.

Moreover, non-parametric methods are not concerned with the relationship between the sets of the data. Generally, these methods do not require assumptions about the data, and can be used with a broader range of data. Parametric approaches have been used in many researchers. For example, they have been used to determine the efficiency of European banks, Washington State hospitals, Taiwanese international tourist hotels and to identify efficiency in productivity changes of Bangladeshi crop agriculture (Berger et al. 1993; Schure et al. 2004; Li and Rosenman, 2001; Chen, 2007; Coelli et al., 2003). Non-parametric approaches have been used to measure the efficiency of Malaysian commercial banks, state road transport undertakings, U.S. business schools, top listed Egyptian companies (Tahir et al., 2009; Bhagavath, 2006; Sexton and Comunale, 2004; Mostafa, 2009) and to improve the design of commercial websites (Benslimane and Yang, 2007).

There are many efficiency models available, which can be referred to or adopted in the performance measuring process. Finding the most suitable model that is easy to use and effective is crucial. Further, several questions need to be answered once the model has been found, such as whether the model can offer suggestions to the management on how to improve their inefficiencies, if such exist. It is also necessary to consider the variables to be used and whether it is possible to include the identified variables simultaneously since production system is actually an integration of all of these variables. Organizations also emphasize the utilization of input such as labour, raw materials and capital efficiency to produce output such as revenue and profit (Cooper et al., 2007). The efficient utilization of input will eliminate waste, increase output and increase organization's profit (Inoni 2007). Therefore, the need for efficiency measurement is vital for an organization to improve and succeed in the face of competition. Output is produced through the utilization of input by decision making unit (DMU). Models for measuring the efficiency of DMU within the specific industry and public listed companies have been proposed by Mostafa (2009), Fang et al. (2008), Mohammad and Said (2010), Ho (2008), Wu and Ho (2007), Jusoh et al. (2007), Huang et al. (2012), Yu at el. (2012), Lu and Hung (2009),Memon and Tahir (2012) and Ismail (2009). Ku Mahamud et al. (2011) conducted a study to show that DEA can be used to measure business efficiency for product within an organization or company. This study focuses on developing an operational efficiency measurement model based on the manufacturing within an industry using the non-parametric approach. Specifically, the study aims to identify suitable input and output variables, identify companies that are efficient and inefficient, and rank the companies based on their efficiencies.

3. METHODOLOGY

3.1 Case Data

Data of Malaysian manufacturing companies publicly listed at Kuala Lumpur Financial Bourse (KLFB) were obtained from one of the leading financial database provided by DATASTREAM source. The first step in conducting a DEA is the determination of inputs and outputs to be chosen according to the types of efficiency being evaluated and to obtain a good efficiency performance model (Sherman and Rupert, 2006). There is no diagnostic checks for model specification in DEA but the number of DMUs should be more than or equal to three times the sum of inputs and outputs as suggested by Raab and Lichty (2002). From 341 manufacturing companies listed in 2010, a total of 80 (or 29%) best performers were chosen as DMUs and were divided into two categories: consumer products (40 companies) and industrial products (40 companies). Six inputs and two outputs were identified as appropriate for the construction of the efficiency performance model. The inputs were plant & property (P&P), current asset (CA), cost of goods sold (COGS), selling & administration costs (SELADM), depreciation (TDEPR) and staff salaries (SALARIES). The outputs chosen were company sales (SALES) and net profit (NETINCOME). All variables' data were obtaine d from company financial statement of year 2010. Appendix 1 shows a sample of companies with their respective inputs and output and Table 1 shows the descriptive analysis of variables used in this study.

Table 1: Descriptive Statistics of Inputs and Outputs Variables

	Max	**Min**	**Average**	**SD**
P&P	6461614	22232	479286.7	881300.8
CA	11799544	49378	624421.2	1410644
COGS	10097380	35314	841780.1	1478249
SELADM	887038	4525	105670.3	179924.5
TDEPR	622976	895	43725.91	94708.93
SALARIES	756255	8681	77972.05	128879.404
SALES	10376394	51212	1098935	1710608
NETINCOME	940896	237	87987.4125	149608.0462

3.2 Company Performance Model

DEA which is a multi-variable model for measuring the relative efficiency of a homogeneous set of DMUs can be used to concert multiples inputs (resources) to produce multiple outputs (performance). The efficiency score for each DMU is equal to the ratio of the weighted sum of multiple outputs to the weighted sum of inputs, and is optimized as many times as the total number of DMUs. The general efficiency measure is given by a simple and easy way to measure efficiency of a DMU which have one input and one output is to determine the ratio of output to the input. The general efficiency measure is given by:

$$\text{Efficiency} = \frac{\text{output}}{\text{input}}$$

The efficiency increases as the output value becomes larger and the input becomes smaller. However, in reality, an organization operates with multiple inputs to produce multiple outputs. This becomes the drawback of an efficiency measure which cannot utilize the situation where there is more than one input or more than one output. Using DEA, the choice of optimal system of weights for a *j*th project involves solving a mathematical optimization model whose decision variables are the weights associated with each output and input. Various formulations have been proposed such as the ratio, additive, multiplicative, Charnes, Cooper and Rhodes (CCR) (Charnes et al., 1978) and Banker, Charnes and Cooper (BCC) (Banker et al., 1984) models. This study has focused on CCR and BCC models where the efficiency of each company has to be optimized individually.

The input orientated model emphasizes on how to use minimum input resources to achieve a given level of output. Meanwhile output oriented model focuses on using a given set of input to achieve the maximum possible output. The relative efficiency of company can be measured through either of these models. The CCR model has an assumption of constant return to scale (CRS) for inputs and outputs whereas the BCC model takes into consideration of variable returns to scale (VRS). The proposed model will determine the scale of efficiency (SE) of units and evaluates whether increasing, constant or decreasing returns to scale (RTS). Both CCR and BCC models will help to identify the overall technical efficiency (TE), scale efficiency and return to scale.

3.3 Model Validation

The proposed performance model was validated for effectiveness using the correlation test to see whether inputs and outputs have "isotonicity" relationship (Avkiran, 1999). From Table 2, it can be seen that relationships between inputs and outputs variables are all positive and show a fairly high correlated. Therefore the inclusion of the inputs and outputs was justified.

Table 2: The Pearson Correlation Coefficient of Inputs and Outputs Variables

	P&P	CA	COGS	SELADM	TDEPR	SALARIES	SALES	NETINCOME
P&P	1.00	0.58	0.45	0.39	0.91	0.65	0.55	0.74
CA	0.58	1.00	0.61	0.66	0.49	0.78	0.67	0.52
COGS	0.45	0.61	1.00	0.54	0.54	0.64	0.98	0.39
SELADM	0.39	0.66	0.54	1.00	0.42	0.79	0.65	0.59
TDEPR	0.91	0.49	0.54	0.42	1.00	0.75	0.63	0.69
SALARIES	0.65	0.78	0.64	0.79	0.75	1.00	0.73	0.59
SALES	0.55	0.67	0.98	0.65	0.63	0.73	1.00	0.54
NETINCOME	0.74	0.52	0.39	0.59	0.69	0.59	0.54	1.00

4. EXPERIMENT RESULTS AND INTERPRETATIONS

This study performed two DEA models CCR and BCC using Saitech software solver to analyse the data under output-oriented DEA model under the assumptions of CRS and VRS. The efficiency scores were obtained for each company as a measure of comparative efficiency performance among the companies under investigation.

Table 3 depicts the overall efficiency, technical efficiency and scale efficiency for output orientation of 80 companies based on CCR and BCC models. The following subsections present discussions on technical efficiency analysis and return to scale analysis.

4.1 Technical Efficiency Analysis

Under the assumption of CRS, 14 companies or 18% from 80 companies are considered efficiency were the score are equal to 1 and the remaining 65 or 82% of the companies efficiency score are below 1 and considered inefficient. Under VRS, pure technical scale efficiency scores show that 31 or 39% of company efficiency score under I and consider operating efficiently. The remaining 49 or 61% companies were operating under inefficiently. On average the manufacturing company operational efficiency is 0.88 under CRS and 0.92 under VRS. With existing consumption of inputs, company should improve their production around 20% in order to be efficient in production. Otherwise to maintain the current production or outputs the companies should reduce consumption of inputs by 20 % or reduce inputs wastage. The lowest efficiency scores were 0.70 (CRS) and 0.75 (VRS). These values are quite high for any inefficient companies because the sample for the study is from the top financial performers for the year 2010.

4.2 Return to Scale Analysis
The VRS efficiency score is used to measure pure technical efficiency. The ratio of CRS and VRS efficiency reflects the scale efficiency. Only 14 companies under VRS efficient units were considered operating under scale efficiency and these companies were also operating under efficiency for both CRS and VRS (refer Table 3). The remaining 17 VRS efficient units were not able to register best operational performance scores because of limitations of their scale and operation.

Table 3: Efficiency Scores of Operational Performance Models

NO	COMP	TE (CRS)	PTE (VRS)	SE (TE/PTE)	NO	COMP	TE (CRS)	PTE (VRS)	SE (TE/PTE)
1	NYLE	1.00	1.00	1.00	41	MLAY	0.87	0.93	0.94
2	SHEL	1.00	1.00	1.00	42	HTU	0.87	0.87	1.00
3	PETT	1.00	1.00	1.00	43	MACE	0.87	0.87	1.00
4	BONI	1.00	1.00	1.00	44	DAIB	0.87	0.88	0.99
5	HARA	1.00	1.00	1.00	45	ACOS	0.86	0.90	0.96
6	KKBE	1.00	1.00	1.00	46	LTKM	0.86	1.00	0.86
7	COAS	1.00	1.00	1.00	47	ANCO	0.85	0.86	0.99
8	XIDE	1.00	1.00	1.00	48	EVEB	0.85	0.85	1.00
9	XING	1.00	1.00	1.00	49	TANT	0.85	0.87	0.98
10	BUIL	1.00	1.00	1.00	50	TOHE	0.85	0.94	0.90
11	DUBM	1.00	1.00	1.00	51	WLCH	0.85	1.00	0.85
12	MCLC	1.00	1.00	1.00	52	SILB	0.85	0.96	0.88
13	GUAH	1.00	1.00	1.00	53	JADI	0.85	1.00	0.85
14	ROTM	1.00	1.00	1.00	54	CSNE	0.83	1.00	0.83
15	DEBH	0.99	1.00	0.99	55	ORFO	0.83	1.00	0.83
16	YOCB	0.97	1.00	0.97	56	APOL	0.83	0.85	0.97
17	DUOP	0.97	1.00	0.97	57	APHE	0.82	0.83	0.98
18	TASK	0.97	0.98	0.99	58	ANNJ	0.81	0.92	0.88
19	HONI	0.97	1.00	0.97	59	LING	0.81	0.86	0.95
20	CCKC	0.96	1.00	0.96	60	STEX	0.80	0.81	1.00
21	LATE	0.95	0.97	0.98	61	VSIN	0.80	0.82	0.98
22	CIHG	0.95	0.95	1.00	62	BTEX	0.79	0.79	1.00
23	NEST	0.95	0.98	0.97	63	CMCO	0.79	0.86	0.92
24	KAWN	0.94	1.00	0.94	64	LAYH	0.79	0.83	0.95
25	MATS	0.94	0.98	0.96	65	JAYC	0.79	0.82	0.96
26	FORM	0.94	0.94	1.00	66	LBIS	0.79	0.81	0.97
27	SIGN	0.93	1.00	0.93	67	GRND	0.78	0.80	0.98
28	ONAS	0.93	0.93	1.00	68	PRTN	0.78	1.00	0.78
29	LEAD	0.91	0.95	0.96	69	SKPR	0.78	0.82	0.95
30	EPMA	0.91	0.93	0.97	70	AJIY	0.78	0.78	1.00
31	MAFL	0.91	0.95	0.95	71	SEAI	0.78	0.79	0.99
32	GUAN	0.89	0.89	1.00	72	ADVA	0.78	0.78	0.99
33	HUSI	0.89	0.91	0.97	73	PULP	0.77	1.00	0.77
34	POKH	0.89	0.89	1.00	74	CHON	0.77	0.77	0.99
35	MAME	0.88	0.89	1.00	75	MIN	0.76	1.00	0.76
36	QLRE	0.88	0.91	0.97	76	YILA	0.75	0.78	0.97

37	KIND	0.88	1.00	0.88	77	PMET	0.74	0.84	0.88
38	APMA	0.88	0.90	0.97	78	DVRS	0.71	1.00	0.71
39	MATE	0.87	0.91	0.96	79	CAMR	0.71	0.83	0.86
40	MARI	0.87	0.87	1.00	80	WTKB	0.70	0.75	0.93

Figure 1 displays the distribution of efficiency scores for both CCR and BCC output orientation model proposed in this study. For BCC model, more than half of the companies obtained an efficiency score between 0.9 and 1.0 as compared to only one third of the total companies under the CCR model. This scenario is again reflected in Table 4.

Figure 1: Efficiency Score Distribution

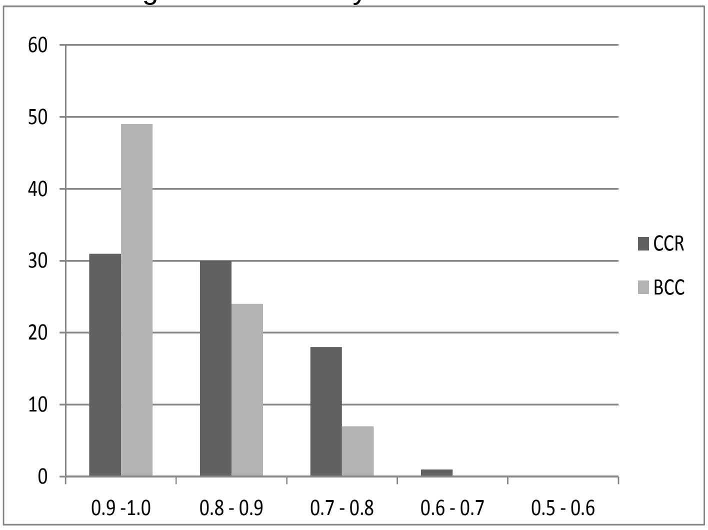

Table 4: Summary of Efficiency Score

DEA Models	CCR	BCC
No. of Companies	80	80
Average Scores	0.88	0.92
Standard Deviation	0.08	0.07
Maximum	1	1
Minimum	0.70	0.75
No. of Efficient Companies	14 (18%)	31 (39%)
No. of Inefficient Companies	66 (82%)	49 (61%)

5. CONCLUSION

This study has utilized output oriented DEA methodology under the assumption of CRS and VRS to evaluate the operational performance of Malaysia manufacturing company listed in KLFB. The proposed efficiency model which consists of six inputs and two outputs was able to identify the performances of the companies under the output orientation approach. Future work will concentrate on temporal data of longer which can portray the management trend of the companies. Bigger company sample size which includes various company efficiency performance could also be used to reflect the actual scenario of Malaysian manufacturing companies.

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References

Avkiran, N.K. (1999). Productivity analysis in the services sector with data envelopment analysis, Queensland: Camira.

Banker, R.D, Charnes, A. and Cooper, W.W. (1984). Model for the estimation of technical and scale efficiencies in data envelopment analysis. *Management Science,* 30, 1078-1092.

Barros, C. (2004). Measuring performance in defence-sector companies in a small NATO member country. *Journal of Economic Studies*, 31, 112–128.

Benslimane, Y. and Yang, Z. (2007). Linking commercial website functions to perceived usefulness: A free disposal hull approach. *Mathematical and Computer Modeling,* 46, 1191-1202.

Bhagavath, V. (2009). Technical efficiency measurement by data envelopment analysis: An application in transport. *Alliance Journal of Business Research,* 1, 60-72.

Charnes, A., Cooper, W.W., and Rhodes, E. (1978). Measuring the efficiency of decision making units. *European Journal of Operational Research,* 2, 429-444.

Charnes, A., Clark, T., Cooper, W.W. and Golany, B. (1985). A development study of dataenvelopment analysis: Measuring the efficiency of maintenance units in the US air force. *Annals of Operational Research,* 2, 95-112.

Chen, C. (2007). Applying the stochastic frontier approach to measure hotel managerial effciency in Taiwan. *Tourism Management*, 28, 696–702.

Coelli, T., Rahman, S. and Thirtle, C. (2003). A stochastic frontier approach to total factor productivity measurement in Bangladesh crop agriculture, 1961–92. *Journal of International Development*, 15, 321–333.

Cooper, W.W., Ruiz, J.L. and Sirvent, I. (2007). Choosing weights from alternative optimal solutions of dual multiplier models in DEA. *European Journal of Operational Research*, 180(1), 443-458.

Fang, S.L., Meng, L.H. and Ting, C.J. (2008). Applying data envelopment analysis in measuring the efficiency – a case study in Taiwan PCB industry. P*roceedings of the* 9^{th} *Pacific Industrial Engineering and Management Systems Conference,* 707-716.

Ho, C.T.B. (2008). Measuring profitability and marketability in Internet companies. *The Open Management Journal,* 1, 12-25.

Huang, L.H., Hsiao, H.C and Wang, J.C (2012). The efficiency performance of Taiwanese enterprises in China: Tax incentive perspective. African Journal of Business Management 6(12), pp. 4432-4444.

Huth, R. and Pokorna, L. (2004) Parametric versus non-parametric estimates of climate trends. *Theoretical and Applied Climatology*, 77, 107-112.

Inoni O. E. (2007). Allocative Efficiency in Pond Fish Production in Delta State, Nigeria: A Production Function Approach. *Agricultura Tropica Et Subtropica*, 40, 127-134.

Jusoh, R., Ibrahim, D.N. and Zainuddin, Y. (2007). The performance consequence of multiple performance measures usage: Evidence from the Malaysia manufacturers. International Journal of productivity and performance management, 57(2), 119-136.

Ku-Mahamud, K.R., Mat Kasim, M., Abd Ghani, N.F. and Abdullah, F. (2011). An Efficiency Analysis of Projects Using DEA. *European Journal of Scientific Research*, 52(4), 476-486.

Li, T. and Rosenman, R. (2001).Cost Inefficiency in Washington Hospitals: A Stochastic Frontier Approach Using Panel Data Health Care. *Management Science* 4, 73–81, 2001.

Lu, W.N. and Hung, S.W. (2009) Evaluating profitability and marketability of Taiwan's IC Fabless firms: An DEA approach. Journal of Scientific and Industrial research 68, 851-857.

Memon, M.A and Tahir, I.M. (2012). Performance of manufacturing Companies in Pakistan. Business Management Dynamics, 1(7), 12-21.

Mohamad, N.H. and Said, F. (2010). Measuring the performance of 100 largest listed Companies in Malaysia. African Journal of Business Management, 4(13), 3178-3190.

Mostafa, M.M. (2009). Modeling the competitive market efficiency of Egyptian companies: A probabilistic neural network analysis Source. *Expert Systems with Applications: An International Journal*, 36(5), 8839-8848.

Productivity Report 2010/2011, Malaysia Productivity Corporation.

Raab, R.L. and Lichty, R.W. (2002). Identifying Subareas That Comprise A Greater Metropolitan Area: The Criterion of County Relative Efficiency, *Journal of Regional Science,* 42, 579-594.

Sherman, H.D. and Rupert, T.J. (2006). Do bank mergers have hidden or foregone value? Realized and unrealized operating synergies in one bank merger. *European Journal of Operational Research,168*(1), 253–268.

Schure, P., Wagenvoort, R. and O'Brien, D. (2004). The efficiency and the conduct of European banks: Developments after 1992. *Review of Financial Economics*, 13, 371–96.

Sexton, T.R. and Comunale, C.L. (2004). An efficiency analysis of U.S. business schools. *Journal of Case Studies in Accreditation and Assessment,* 1-19.

Tahir, I.M., Abu Bakar, N.M. and Haron, S. (2009). Evaluating efficiency of Malaysian banks using data envelopment analysis. *International Journal of Business and Management,* 4(8), 96-106.

Wu, D.D. and Ho Bruce C.T.B. (2007). Productivity and efficiency analysis of Taiwan's integrated circuit industry. *International of Productivity and Performance Management*, 56(8), 715-730.

Yu, Y.S., Han. H.T. and Barros, A. (2012). Evaluating technical efficiency of Taiwan public listed companies: An application of data envelopment analysis. *Interdisciplinary Journal of Research in Business,* 1(11), 15-22.

Appendix 1: Sample of Inputs and Outputs Data

NO	**COMP**	**P&P**	**CA**	**COGS**	**SELADM**	**TDEPR**	**SALARIES**	**SALES**	**NETINCO**
1	PRTN	2624418	3880614	6990320	711674	514300	756255	8226859	218932
2	GUAN	213502	422885	942138	182891	31122	56324	1358633	152691
3	BONI	62328	185538	140305	165869	13471	63803	360099	33547
4	NEST	897505	783869	2579406	845370	101112	405080	4026319	391398
5	MAFL	224222	779894	1282949	112346	17066	80302	1555091	84824
6	QLRE	539259	452087	1190524	95147	39445	74707	1476396	106914
7	XIDE	123912	175214	313002	42561	895	15810	465081	77913
8	XING	79128	356457	408672	58174	6049	58431	606282	107073
9	SIGN	23718	102340	93156	19316	1541	16550	138363	15028
10	DUOP	100249	96230	66639	21834	5301	19256	131437	28669
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70	ANNJ	1070052	1601800	1587248	77008	30769	79308	1831871	119903
71	TOHE	116984	326490	294773	13690	10815	9845	344279	25387
72	ONAS	284141	576742	895283	26190	39997	27270	1034734	69180
73	ANCO	172860	549120	1287129	166157	20589	82290	1513137	1480
74	SKPR	68850	99721	147588	21738	9663	29475	195735	13404
75	SEAI	450816	381316	141001	22562	26316	26918	224892	33374
76	PULP	46707	131874	143237	9363	3712	8976	162009	19870
77	MATE	61493	115534	316540	31712	6164	40023	376717	16495
78	NYLE	50652	365522	1072384	94155	8407	42466	1222086	35114
79	CMCO	629091	992200	1352166	125837	44645	95536	1639039	15372
80	GRND	171325	228123	246716	15142	11906	41991	309272	43772