# Chiun-Jung Lin<sup>1</sup>, Qiusheng Zhang<sup>2</sup>, Jin-Li Hu<sup>3</sup> EFFICIENCY CHARACTERISTICS OF TARGET COMPANIES FOR MERGER AND ACQUISITION: EVIDENCE FROM CHINA\*

There is evidence of the efficiency of takeover target companies in the incipient Chinese market which has several types of mergers and acquisitions (M&A). These include market-driven takeovers, affiliate-predominated takeovers and government-predominated takeovers. This paper is based on the research in the selected major M&A transactions in China after 2005 when share trading regulations were reformed. Data envelopment analysis (DEA) is applied to compute the premerger efficiency of target companies. The research findings provide evidence from China to confirm various efficiency characteristics of different types of takeovers and to verify the effect of the market for corporate control (MCC). Our research reflects a planned economy in transformation, and also demonstrates that DEA can be applied to identify the pre-merger efficiency of targets. **Keywords:** mergers and acquisitions, data envelopment analysis, efficiency, profitability, corporate control.

# Чіунь Чжун Лінь, Цюшен Чжан, Цзінь-Лі Ху ПОКАЗНИКИ ЕФЕКТИВНОСТІ КОМПАНІЙ – ОБ'ЄКТІВ ЗЛИТТІВ І ПОГЛИНАНЬ (ЗА ДАНИМИ КИТАЮ)

У статті показано, що в Китаї існує декілька типів злиттів і поглинань в залежності від ефективності об'єкту злиття. Можна виділити такі види: поглинання під впливом ринку, афілійовані поглинання і поглинання за участю уряду. Використано дані щодо великих злиттів і поглинань після 2005 р., коли була реформована торгівля акціями. Застосовано аналіз середи функціонування для обчислення ефективності компанійоб'єктів до злиття. Результати підтвердили різні характеристики ефективності у різних типів поглинань і вплив ринку корпоративного контролю. Підкреслено риси перехідної планової економіки і те, як аналіз середи функціонування може бути застосовано для вимірювання ефективності компаній – об'єктів поглинань.

**Ключові слова:** злиття і поглинання, аналіз середи функціонування, ефективність, прибутковість, корпоративний контроль.

Рис. 1. Табл. 2. Літ. 18.

# Чиунь Чжун Линь, Цюшен Чжан, Цзинь-Ли Ху ПОКАЗАТЕЛИ ЭФФЕКТИВНОСТИ КОМПАНИЙ – ОБЪЕКТОВ СЛИЯНИЙ И ПОГЛОЩЕНИЙ (ПО ДАННЫМ КИТАЯ)

В статье показано, что в Китае существует несколько типов слияний и поглощений в зависимости от эффективности объекта слияния. Можно выделить такие виды: поглощения под влиянием рынка, аффилированные поглощения и поглощения с участием правительства. Использованы данные по крупным слияниям и поглощениям после 2005 г., когда была реформирована торговля акциями. Применен анализ среды функционирования для вычисления эффективности компаний-объектов до слияния. Результаты подтвердили различные характеристики эффективности у различных типов поглощений и влияние рынка корпоративного контроля. Подчеркнуты черты переходной плановой экономики и то, как анализ среды функционирования может быть применен для измерения эффективности компаний – объектов поглощений.

**Ключевые слова:** слияния и поглощения, анализ среды функционирования, эффективность, прибыльность, корпоративный контроль.

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### 1. Introduction.

Beginning in the 20th century mergers and acquisitions (M&A) have been one of the expansion measurement in the modern global economy. To facilitate mergers and acquisitions, researchers have been trying to identify the characteristics of possible takeover companies (Pasiouras et al., 2010). These characteristics of possible takeover companies are also used in other research, e.g. mechanism of the market for corporate control (Manne, 1965; Franks and Mayer, 1996; Dickerson et al., 2002), and especially in M&A predictions (Palepu, 1986; Kim et al., 1998; Tsagkanos et al., 2006; Brar et al., 2009).

Among the important characteristics of target companies is efficiency which is not only used to identify targets, but also in the determination of the market for corporate control (MCC). According to this hypothesis, many mergers probably are the results of a combination of successful MCC implementation and managerial inefficiency. Dickerson et al. (2002) has remarked on one of the conditions for more effective MCC operations. That is, if poorly performing firms are not taken over, then it is an evidence of a MCC malfunction. Therefore, efficiency is one of the key indexes in this takeover mechanism.

Previous studies related to characteristics of target companies are concerned primarily with large corporate controlled markets such as the USA (Palepu, 1986; Kim et al., 1998) and the UK (Franks and Mayer, 1996; Dickerson et al., 2002). These studies, which primarily use the hypothesis of MCC as a theoretical background (Tsagkanos et al., 2006), assume that the takeover mechanism exists to discipline and replace management teams who engage in inefficient behavior (Palepu, 1986; Dickerson et al., 2002; Brar, 2009). Compared to previous studies which focus on large corporate controlled markets, this paper provides new evidence concerning a developing and transforming economy such as China, which is an incipient but heavy transaction market for M&A, and we will focus on studying the efficiency of target companies in the pre-merger stage, and discuss the effect of the takeover mechanism to discipline and replace inefficient management teams.

Fundamentally, China is in transition which is changing from the planned to market economy. During the transition stage Chinese economy is a kaleidoscope of mixed public and private property forms (Stark, 1996), described as "socialist market economy". Therefore, Chinese M&A activity is complex and different from Western countries which operate under market economy. For example, takeovers driven by government-operated firms and private-operated firms coexist at the market. Stakeholders are also keen to participate in transactions with affiliates to maximum their self-interests since the regulations of corporate governance are still developing. In summary, M&A activities in China can be classified into market-driven takeovers and non-market-driven takeovers. The motivation for market-driven takeovers is to growth expansion, which is common in the West. The non-market-driven takeover, which can be classified into government-predominated takeover and affiliate-predominated takeover, is a unique phenomenon in this socialist transforming economy. All the above 3 alternative types of takeovers are evidence of the transformation of the planned market economy in China.

Since the means of takeover in China are diversified, previous studies are insufficient. Researchers are concerned mostly with market-driven takeovers, as they consider that non-market-driven takeovers are not purely M&A, but are restructuring. Moreover, the year 2005 is a milestone in the economic transformation of China, since the government reformed the share trading regulations which releases the restriction of state-owned shares for transaction; however, studies in the period after 2005 are still very limited. The results of these studies show the inefficient and poor performance of target companies, as most of them are shell companies targeted for reverse listing (Li and Zeng, 2003). We can conclude from the findings that target companies are inefficienty; however, this conclusion is not consistent with various conditions in Western countries. Another issue in Chinese M&A research is the difficulty on data gathering, hence most studies cover single year rather than a longer period. Our analysis will be different from previous studies since we focus on transactions after 2005; we sample for longer period, and cover the above mentioned 3 types of takeovers in China.

To objectively measure management efficiency is another aspect of our analysis. Previous studies typically adopt various performance indicators to measure the efficiency, i.e. accounting variables (Palepu, 1986; Kim, 1998; Li and Zeng, 2003; Brar, 2009), non-accounting variables (Tsagkanos, 2006), and share prices (Manne, 1965) etc., however, it is unclear which measure is appropriate. Data envelopment analysis (DEA) is a technique used to assess productive efficiency of homogenous operating units (Charnes, Cooper and Rhodes, 1978). As a measurement of objectivity and ability to handle multiple inputs and outputs that can be measured in different units and transformed to a single indicator, DEA is often used for measuring efficiency and performance.

Although DEA is a good tool to measure efficiency and performance, in M&A studies this methodology is often used to evaluate the M&A impact by comparing the performance prior and after M&A (Worthington, 2001; Kwoka and Pollitt, 2010), researches on usage in the pre-merger stage are rare. However, some researchers have noticed this methodology and advocated its use before M&A. Lozano (2010) applies this methodology as a pre-merger planning tool to estimate the expected cost and profit efficiency gains. In contrast to previous studies which use ratio indicators to identify the efficiency of target companies, our study will apply DEA to evaluate the pre-merger efficiency of target companies in non-ratio form.

In comparison with the above mentioned studies, this paper introduces various innovations. In particular, DEA is used to identify the efficiency of target companies. In comparison with ratio analysis which is restricted to a single input and a single output and chose subjectively, DEA handles multiple inputs and outputs which is more objective. Furthermore, this paper provides evidence on the planned economy in transformation such as China, which is an incipient but active market for M&A. Finally, in contrast to previous Chinese studies concerned mostly with market-driven takeovers, this paper will cover market-driven takeovers and non-market-driven takeovers to present evidence of the transformation of the planned market economy in China. It is worth noting that previous literature mostly has shown the characteristics of targets before the reforming of share trading regulations in 2005, which in part reflects the characteristics of target companies in China. Our study will select transactions after 2005 and use a longer period.

The paper is organized as follows: Section II presents the methodology, the data and variables used. Section III demonstrates the empirical findings. In Section IV we evaluate the results.

## 2. Methodology, Data Set and Variables.

**2.1. Methodology.** Our study uses DEA to analyze market-driven takeovers, government-predominated takeovers, and affiliate-predominated takeovers, in order to compare the efficiency of target companies. Since China is a planned economy with market mechanism, the decision for input allocation could be influenced by government policies; therefore, output-orientated measures are used, following Farrell's (1957) original ideas. The output-orientated DEA model under constant returns to scale (CRS) is used to find the overall technical efficiency (OTE) scores of target companies in 3 alternative types of transactions. The OTE of each decision-making unit (DMU) is found compared to the companies in the same industry in the same year.

By adding the convexity constraint:  $N1'\lambda=1$  to the CRS model, the variable returns to scale (VRS) DEA model is derived, where N is the number of objects and  $\lambda$  is the  $N^*1$  vector of constants. Note that OTE can be decomposed into the product of VRS technical efficiency (i.e., pure technical efficiency, PTE) and the scale efficiency (SE); that is  $OTE=PTE^*SE$ .

As the value of SE does not indicate whether a firm is operating in an increasing or decreasing returns stage, the VRS DEA model is altered by substituting  $N1'\lambda=1$  restriction with  $N1'\lambda<1$ , in order to judge the stage returns to scale for the DMU (see Coelli et al. 2005, p. 174 for details).

In order to have sufficient discriminating power a DEA model, the number of DMUs should be no less than twice the number of input and output variables (Gao et al., 2002). We used the Mann-Whitney test to examine the difference in efficiency between 3 kinds of takeovers.

2.2. Data Set and Variables. The M&A data are those companies of A-share at Chinese stock market during 2005–2009. Because information about transactions in China is difficult to collect, researchers often obtain data through various channels (e.g., personal databases and economic journals) and select samples subjectively which will limit the comprehensive usage of the data. To overcome this limitation, our study sources information from alternative databases which provide sufficient information for our analysis. The Guo Tai An (GTA) database is the major source of transactions, and the retrieved data is verified by RESSET, TEJ, WIND and CMARC databases. Since the aim is to identify the efficiency of target companies in the pre-merger stage, data of the year t-1 is used relative to the merger news for the first announcement year t. Of the 18,594 transaction records in the GTA database, 129 targets of listed companies in Shanghai and Shenzhen Stock Exchange are identified from transactions which have successfully transferred the corporate controls. To isolate exogenous industry effects from the analysis, our study uses employee and fixed assets as our inputs and net sales as our outputs which are industry-wide variables. The data of input and output variables is stemmed from Taiwan Economic Journal (TEJ) Database, and with the reference to GTA and RESSET Database to supplement the missing data.

As our research just focuses on a specific indicator to represent the overall efficiency of the targets, and OTE can reflect the join effect of PTE and SE, therefore, we choose OTE as the proxy of managerial ability and corporate efficiency indicator in our analysis. The OTE of each target is calculated based on the benchmarked firms with similar industry sectors and size on the same year. Our analysis selects two input variables and one output variable in the DEA model so that the number of DMUs should be no less than 6 in each DEA model. Filtered by the aforementioned rule of thumb on DEA samplings, there are 93 takeover companies remaining, which consist of 49 market-driven takeovers, 15 affiliate-predominated takeovers and 29 government-predominated takeovers.

## 3. Empirical Results.

This paper employs DEAP software to analyze the corporate efficiency of Chinese listed companies before takeovers during 2005–2009. Figure 1 presents the empirical findings of the scale of efficiency on the 3 types of takeovers. The results show that the majority of target companies, either market-driven takeover or non-market-driven takeovers, manifest a DRS stage, which indicates that those companies are too large to operate effectively. In order to operate at the most productive scale size, targets exhibiting DRS should scale down its operations.



OTE is defined as the corporate efficiency indicator, and the average OTE of DMUs is used as the efficiency benchmark of peers. If OTE of a target company is lower than this benchmark, then it is defined as underperforming and inefficient. Here we also use one standard deviation (SD) of the OTE of DMU as a cutoff point. If OTE of a target company is lower than AVE minus SD, it is defined as extremely underperforming and inefficient. For all takeover companies in Table 1,54% of them are underperforming in the peer group, however, only 10% fall under the range of extreme inefficiency. The result reveals that those drastically underperforming and inefficient targets are not suited to acquirers' specifications. When the sample is breakdown into 3 types, the results are diversified. The efficiency of target companies in the affiliate-predominated takeovers are the worst among the 3 types of transactions. As we mention previously companies are difficult to list at Chinese stock market, stakeholders would rather make an affiliate transaction to acquire the targets rather than abandon the control right.

Targets of government-predominated takeovers are the best in efficiency, since only 34% of targets are underperforming in their peer group. Essentially, stateowned enterprises dominate business development in China, and most of them are superior to private companies, therefore, the efficiency of government-predominated targets are higher than their peers. Although Chinese economy is retracking from the planned economy to a market one, it is still predominately a planned economy. Most transactions are controlled by the government and not driven by market but by a plan.

The efficiency of target companies in market-driven takeovers is between the previous 2 types of takeovers. On average 57% are underperforming relative to their industry peers, which does not mean that targets are necessarily inefficient. This result is in line with many other studies which have not found poor performance to be a reason for takeovers (Franks and Mayer, 1996). Of the sample, 19% are at the IRS or CRS stage, which indicates those companies either operate under most productive scale sizes or should expand their operation to become scale efficient.

In the context of the above findings on efficiency which will be the proxy of managerial ability, there is no significant evidence of the effective takeover mechanism in China based on the result of all takeovers. This is in line with the view that there is usually not significant evidence of the takeover mechanism in a transforming economy (Zhang, 2008). However, when we breakdown takeovers into the aforementioned 3 different types, the results are diversified. Target companies of the affiliate-predominated takeovers are the most inefficient among the 3. About 80% are below the average efficiency. For other 2 types of takeovers, there are no significant signals on the inefficiency of targets. In summary, following the analysis of Dickerson et al. (2002), we conclude that in China the takeover mechanism of the affiliated transaction can truly discipline and replace inefficient management teams. The above diversified findings present evidence of transformation of a planned market economy in China.

Tunes	Ave OTE	OTE < Ave OTE (b),		OTE < Ave- SD		
Types	(a) %		DK3 70	(c), %	DR0/0	
Mark et-Driven	0.44	57	81	10	60	
Affiliate-Predominated	0.29	80	91	7	100	
Government-Predominated	0.59	34	100	14	100	
All Samples	0.46	54	88	11	80	

Table 1. The Efficiency and Economic Scale Stage of Different Transactions

Note: (a) The value of average OTE (Ave OTE) is to average OTE of targets within each group.

(b) The average OTE of DMU in the same industry in the same year.

(c) The standard deviation (SD) of the OTE of DMU in the same industry in the same year.

Table 2 shows the P-values of the Mann-Whitney test of corporate efficiency between the 3 types of M&A. The P-values represents a significant gap between dif-

ferent types. The result shows a significant difference in government-predominated takeovers compared to the other two types of transactions. As the average OTE of government-predominated takeovers are higher than other two types, we can conclude that the efficiency of targets from government-predominated takeovers are significantly higher than others, which is in line with the fact that the state dominates and allocates profitable resources in the socialist economy.

Pair	n <sub>1</sub>	n <sub>2</sub>	U	Р
Market-Driven vs. Affiliate-Predominated	49	15	466.5	0.117924
Market-Driven vs. Government-Predominated	49	29	907.5	0.041812**
Affiliate-Predominated vs. Government-Predominated	29	15	343.0	0.001538***

Table 2. The Mann-Whitney test of efficiencies between 3 types of M&As

Note: \* - represents significance at the 10% level;

\*\* - represents significance at the 5%;

\*\*\* - represents significance at the 1% level.

#### 4. Conclusion.

Our paper, in an effort to add to the research literature on takeover target identification, has switched the investigation of this specific issue from large corporate controlled markets to a planned economy in transformation such as China. In contrast to previous Chinese studies concerning mostly market-driven takeovers, this paper covers market-driven takeovers and non-market-driven takeovers to present evidence of the transformation of the planned market economy in China. Moreover, DEA is used to identify the characteristics of efficiency of target companies before M&A, and this efficiency indicator is used to analyze the effect of the takeover mechanism on disciplining and replacing inefficient management teams. Within this framework, the research findings confirm the diversified characteristics of efficiency on different type takeovers. The target companies of government-predominated takeovers are the most efficient among the 3, which reflects the fact that the state dominates and allocates profitable resources in the socialist economy. Targets of affiliate-predominated takeovers are the most inefficient, however, this types of M&A appears to confirm the viewpoint of MCC on the takeover mechanism of disciplining and replacing inefficient management teams. The result on market-driven takeovers is in line with many other studies which have not found poor performance to be a reason for takeovers.

Our study demonstrates that DEA can be applied to identify the pre-merger efficiency of targets, which could be enhanced as a target searching tool before M&A. In more general terms, our study has made the effort to integrate certain new data and methods into the analysis of the M&A compared to that used in previous studies. These findings can be also used with reference to other countries with a transforming economy.

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# Appendix

# Table 1. Descriptive Statistics of Variables -Market-Driven Takeovers

NAME	F 1		Salaa	DMU	Emp	loyee	Fix	ed Asset	Sa	les	OTE	C(
NAME	Employee	- FIX Asset	Sales	Count	AVE	SD	AVE	SD	AVE	SD	OTE	Stage
CAU-Tech	284	24,016	30,948	17	356	218	24,824	28,964	92,214	54,908	0.15	DRS
НҮС	1,100	121,461	582,680	19	1,769	1,555	144,055	104,924	555,202	377, 219	0.37	DRS
Yangguang	158	11 1, 540	812,933	54	605	1,124	182,840	272,968	631,568	511,691	0.38	DRS
Jil in Chemical	20, 445	8,205,652	24,730,038	73	2,610	2,759	922,870	1,114,006	1,347,979	2,890,165	0.55	DRS
Changan Automobil e	7,944	4,283,395	16,572,832	52	4,103	4,235	732,454	817,185	2,680,539	3,650,020	1	CRS
THG	1,350	93, 649	464,714	9	236	423	51,719	69, 436	141,866	157,637	0.13	DRS
CIEI	32	10,997	169,904	28	290	450	87,920	165,607	415,155	325, 372	0.47	IRS
Anhui Zhongding	1,410	243,615	50, 525	22	1,631	1,167	205,962	81, 201	476,837	345, 564	0.04	DRS
Dongling	1,279	172, 914	653,100	17	1,562	1,427	193,346	164,507	556,764	537, 463	0.02	DRS
Tianyi Science & Technology	1,264	153, 951	183,863	23	1,849	1,162	194,555	101,788	386,233	279, 716	0.32	DRS
ARC	1,280	159, 174	127,211	10	1,568	1,428	90,286	47,047	375,803	263, 394	0.11	DRS
ZX B&C	1,735	587, 593	669,438	58	2,185	2,612	369,872	302,063	645,838	663, 856	0.38	DRS
XCMC	5,223	146, 789	366,177	14	1,968	1,810	234,837	118,570	419,936	234, 388	0.68	IRS
Xinlong Holding	668	418,832	134,672	22	2,869	2,304	376,011	225,306	613,664	420,604	0.24	IRS
Zhongnan Construction	3,956	1,575, 106	2,604,980	50	702	1,254	158,871	295,708	730,319	630, 963	0.05	DRS
ZHONGYIN CASHMERE	1,233	146, 982	242,269	23	3,343	2,262	389,996	233,764	671,282	479, 190	0.5	IRS
SINOS TEEL TIANYUAN	403	73, 909	227,478	16	855	720	141,831	87, 679	320,030	222, 757	0.56	IRS
XINGHUA CHEMISTRY	1,460	416, 476	468,714	47	1,505	971	390,270	316,838	730,704	514, 592	0.2	DRS
SEP	6,796	12,637,287	7,457,431	44	2,132	1,930	3,600,146	5,015,051	1,784,082	1,933, 198	0.3	DRS
ELHT	86	338, 262	170,723	32	526	973	127,401	182,892	393,671	510, 766	0.15	DRS
Gree Real Estate	673	164, 804	522,538	11	1,252	775	337,276	270,703	516,965	378,033	0.77	DRS

Jiangsu Wuzhong	2,543	337,704	1,821,211	14	1,251	917	276,393	234,711	740,065	789,342	0.49	DRS
YXMC	2,003	228,419	674,032	32	2,067	1,521	271,775	168,845	742,770	621,180	0.09	DRS
QHHD	3,177	192,116	450,820	21	1,886	1,132	188,036	99,706	369,283	212,420	0.62	DRS
Rising Nonferrous	186	405,192	508,045	9	2,607	2,098	566,516	501,333	939,793	572,040	1	CRS
CRBC	3,472	601,989	3,005,712	13	2,092	2,226	379,790	226,100	1,869,972	1,770,897	0.27	DRS
HPEC	2,864	332,506	1,322,635	28	2,486	2,287	396,439	364,694	1,005,263	886,197	0.35	DRS
ZPMC	1,262	3,643,781	10,351,203	27	2,543	2,799	438,903	696,136	1,391,663	2,336,849	1	CRS
DXS	2,150	130,934	257,164	10	2,179	2,071	212,701	75,440	356,929	116,720	0.67	DRS
Taigong Tiancheng	625	136,292	402,948	20	1,157	1,275	124,951	101,154	668,089	678,598	0.12	DRS
Lingyun Co.	873	362,652	1,057,264	33	2,465	2,003	349,809	232,098	990,365	782,151	0.85	DRS
Nine Dragon	1,303	555,470	604,494	10	1,421	858	417,927	237,441	483,454	695,200	0.43	IRS
Jingneng Thermal Power	1,583	892,706	1,261,289	31	1,643	1,010	1,207,966	702,910	681,785	423,026	0.67	DRS
Cinda Real Estate	1,276	214,960	1,553,953	36	1,343	1,910	102,626	159,143	686,643	950,313	0.23	DRS
ZJGT	143	65,742	371,325	28	648	574	48,710	44,260	298,829	351,088	1	CRS
Tianjin Port	9,021	8,050,158	7,674,132	30	2,133	1,947	2,373,384	2,818,196	1,094,278	1,485,049	0.82	DRS
ЦН	124	33,493	160,727	14	108	87	57,546	77,230	136,371	1 14, 100	0.32	DRS
XLDY	4,360	476,534	674,662	49	1,713	1,110	426,355	293,687	654,694	403,852	0.12	DRS
XCIC	2,687	459,860	724,905	16	1,401	1,127	335,194	261,523	752,460	720,493	0.16	DRS
Chengshang Group	4,061	417,977	1,151,211	32	2,262	1,877	540,101	358,307	1,343,954	1,530,965	0.07	DRS
CCD	740	260,937	203,200	8	1,320	969	231,057	136,754	606,643	541,855	0.27	IRS
XAE	2,190	1,337,073	2,542,121	15	3,158	3,411	567,260	516,349	2,227,828	4,073,778	0.84	DRS
KEDA GROUP	513	463,080	418,096	9	1,265	1,230	330,255	193,816	1,239,190	636,960	0.19	IRS
HYPC	36	88,129	89,740	7	437	265	102,606	59,341	319,869	538,801	0.5	IRS
Rongan Property	203	143,347	61,393	12	696	943	83,525	61,503	239,266	277,680	0.43	DRS
JLP	501	142,426	67,089	9	780	611	121,906	44,253	189,410	111,099	0.18	IRS
Torch	20,259	2,354,099	6,419,120	51	4,465	4,310	746,009	774,375	2,307,145	2,755,880	0.26	DRS
Panda Fireworks	69	42,599	118,373	7	783	1,069	112,480	75,087	260,919	219,746	1	CRS
Dong Fang Boiler	3,519	483,168	9,179,769	29	2,193	1,672	332,853	294,898	1,090,594	1,802,956	1	CRS

## Continuation of Table 1

 Dong Fang Boiler
 3,519
 483,168
 9,179,769
 29
 2,193
 1,672
 333

 Note:
 AVE (Average), SD (Standard Deviation). All monitory units are in year 2000 prices.

ACTUAL PROBLEMS OF ECONOMICS #11(149), 2013

			Sales	DMU Count	Emp	loyee	Fixed Asset		Sales		OTT	<i>a</i> .
NAME	- Employee	Fix Asset	· Sales	DMU Count	AVE	SD	AVE	SD	AVE	SD	OTE	Stage -
Da Tong Gas.	1, 790	198,505	171,819	39	1,178	703	209,551	117,673	314,878	196, 642	0.19	DRS
PR D	1, 918	246,782	1,182,702	37	423	763	137,960	236,109	485,261	380, 078	0.02	DRS
FangDa Carbon	2, 396	466,240	446,544	28	3,317	2,439	564,718	367,224	450,434	241,324	0.37	DRS
CS&S	4, 01 1	326,749	1,146,645	19	1,185	1,304	124,354	103,889	682,044	694,238	0.11	DRS
GZRS	3, 582	315,842	878,942	52	1,784	1,194	538,783	433,796	848,629	586, 858	0.36	DRS
DAAE	4, 27 1	646,028	1,770,102	44	3,639	3,046	641,915	715,752	1,757,677	1,919,272	0.31	IRS
ZOJE	1, 977	225,383	629,736	19	1,501	633	279,097	152,973	574,398	314,237	0.46	DRS
OTIC	1, 773	376,382	601,369	13	1,969	1,126	429,744	272,421	1,781,629	1, 493, 976	0.15	DRS
CNHTC-JNTC	4,080	815,515	7,795,031	51	4,025	3,380	724,030	734,857	2,552,043	3,086,864	0.63	DRS
Guoyuan Securities	1,826	543,176	932,413	48	1,654	1,045	433,412	322,068	660,773	452,403	0.35	DRS
XHDS	633	209,173	1,924,783	31	1,929	1,798	379,662	263,287	1,218,156	853, 712	0.71	DRS
NJ XB	1, 252	820,837	1,171,231	36	3,518	4,726	472,594	434,553	1,713,160	1,463,048	0.22	DRS
CITIC Wine	3, 532	553,381	330,450	15	1,037	944	284,340	268,245	633,435	643, 270	0.05	DRS
SMAC	2, 847	432,854	637,659	7	2,386	2,576	317,535	219,501	688,542	481,616	0.34	DRS
Oceanwide Construction	1,954	51, 790	1,006,754	72	821	1,529	150,743	247,881	1,068,743	1, 294, 564	0.06	DRS

Table 2. Descriptive Statistics of Variables, Affiliate-Predominated Takeovers

Note: AVE (Average), SD (Standard Deviation). All monitory units are in year 2000 prices.

## Table 3. Descriptive Statistics of Variables, Government-Predominated Takeovers

NAME	E	Ein Annt	Salas	DMU Count	Employee		Fixed Asset		Sa	OTE	Stage	
	Employee	FIX Asset	Sales	DMU Count	AVE	SD	AVE	SD	AVE	SD	OIE	Stage
Hefei Department	5,379	712,235	2,688,816	31	2,716	2,996	663,755	553,104	1,637,262	1,199,464	0.48	DRS
HAC	1,176	208,191	789,863	22	1, 887	1,162	217,315	145,548	490,529	396, 757	0.97	DRS
TFE	1,678	715,149	410,842	24	2,715	2,260	460,012	367,758	691,724	480,942	0.25	DRS
NA RI	615	204,467	738,180	25	2, 332	2,271	239, 993	191,932	875,793	779, 785	0.37	CRS
Shanghai Energy Resources	22,990	3, 338,905	3,202,907	15	17, 484	12,006	2,069,917	1, 299,077	2,878,391	1,841,433	0.43	DRS
Black Peony	1,521	394,307	793,890	25	3, 400	2,548	429, 531	264,681	745,486	506, 104	0.81	DRS
Shenzhen Expressway	1,185	4, 469,681	1,008,650	27	1, 567	1,131	2, 370, 483	2,025,885	729,088	607, 148	0.9	DRS

Tsingtao Brewery	27,360	4,374,728	9,638,104	22	5,237	7,773	1,076,197	1,469,735	1,805,627	2,394,714	0.52	DRS
HIGHLY	4,084	1,392,870	2,902,392	32	2,996	2,793	451,912	446,572	1,435,271	1,357,727	0.22	DRS
CSGM	375	184,103	235,821	33	1,955	1,921	357,704	262,442	1,190,327	925,091	0.13	DRS
Jinling Mining	3,214	314,259	83,246	27	3,221	2,454	534,829	363,850	397,430	201,080	0.06	IRS
TJ	548	266,989	869,459	21	1,267	744	187,963	129,875	457,219	307,849	1	CRS
SMEG	955	229,003	1,265,603	21	3,066	2,196	346,097	176,375	634,331	374,054	1	CRS
LYG	5,021	971,579	1,003,238	31	2,735	2,296	658,027	481,211	555,664	335,161	0.43	DRS
Fengle Seed	683	226,789	733,871	9	988	646	222,177	128,477	372,690	237,825	1	CRS
Jidong Equipment	8,697	185,224	249,274	24	2,128	2,319	236,198	206,980	370,133	152,268	0.12	DRS
YCC	12,050	3,784,836	26,374,915	29	4,550	4,298	1,466,271	2,090,700	5,761,135	8,507,913	0.52	DRS
DQHK	564	291,451	636,620	20	1,169	807	211,238	140,873	393,483	209,386	0.84	DRS
CR Wandong	1,115	191,718	391,775	20	1,303	745	184,011	131,947	436,606	300,612	0.5	DRS
SAIC MOTOR	3,154	27,147,759	25,228,222	54	4,374	3,946	1,371,081	3,764,175	3,442,777	5,032,099	1	CRS
CSSC Holdings	3,052	336,727	1,218,831	24	1,993	1,165	264,112	212,970	640,502	609,678	0.84	DRS
GDCH	1,868	906,456	1,777,523	14	3,356	2,636	770,420	533,998	1,092,082	645,736	0.85	IRS
HUAYI	3,284	477,510	1,436,501	29	2,639	2,156	329,935	324,956	1,094,593	950,266	0.25	DRS
SHKK	1,011	222,646	584,223	7	1,151	906	226,730	224,069	357,902	163,066	0.98	DRS
Island Construction	931	383,537	339,460	18	1,652	1,234	293,432	150,653	842,175	464,565	0.14	DRS
Boyuan	2,065	77,747	419,944	21	1,109	793	198,941	154,579	404,232	232,096	0.69	DRS
SLSS	1,550	129,347	1,293,314	24	1,465	1,111	277,763	173,598	987,607	586,860	0.77	DRS
Little Swan	1,597	441,049	3,825,977	40	2,897	3,902	292,946	306,958	1,299,052	1,332,842	0.68	DRS
HFML	2,781	404,765	2,274,185	31	2,819	2,588	397,504	377,670	1,314,722	1,213,844	0.47	DRS

# Continuation of Table 3

Note: AVE (Average), SD (Standard Deviation). All monitory units are in the year 2000 prices.

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