·

1.

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,

(Lovell, 1993).

.

(decision making unit)

Farrell(1957)

,

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.

(technical efficiency)

(allocative efficiency)   .44)   DMU
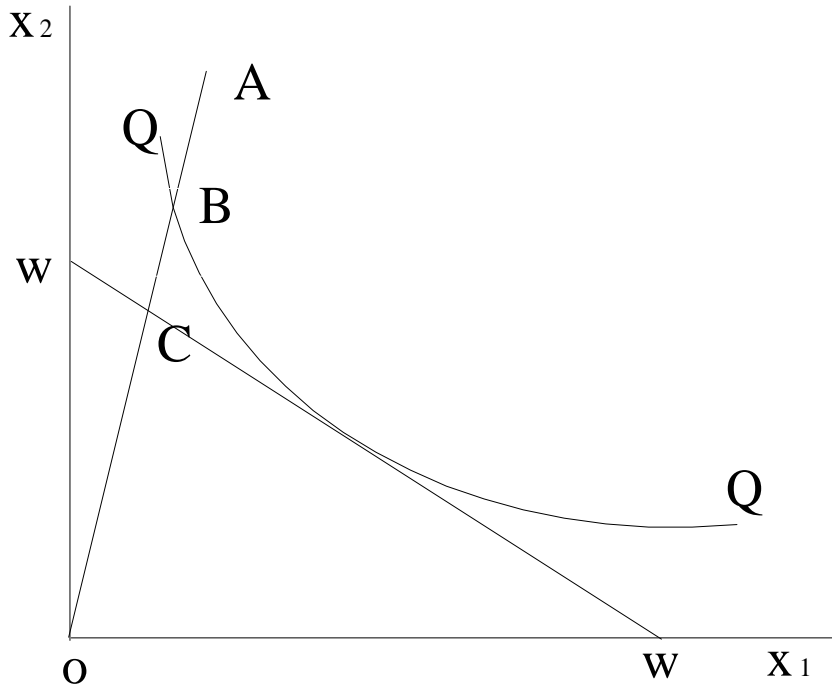
Shepherd(1970)

(distance function)   .

_____

44) Farrell(1957)   ,

.

<그림 IV-1>

(X_1, X_2) (Y) <그림 -1>

(isoquant) QQ', (isocost) WW' A, B, C

.

(Y*) ,

Y* . <그림 -1>

B

, C

. A

B OA/OB

OB/ OA   .

                    OC/ OB   .

                                        <   -1>

          .

          =   (OB/OA)×   (OC/OB)=OC/OA

          .   DEA

DEA(data envelopment analysis)   .

          DEA

  .(Charnes, Cooper and Rhodes : 1978)

                    (DMU)   k

m   , DMU₀ h_0

                                                  .

$$\max \quad h_0 = \frac{'y_{i0}}{'x_{i0}} \tag{1}$$

$$\frac{'y_{ij}}{'x_{ij}} \quad 1 \quad j=1,2, \ldots\ldots n.$$

          $(m \times 1)$, $(k \times 1)$ 0

y_{i0}: DMU₀
x_{i0}: DMU₀
 n:
  :
  :

(1)   (u*, v*)   (u*,   v*)

.   ' $'x_{i0} = 1'$ (1)

                        .

max u y_{i0} (2)

v $x_{i0} = 1$, $j = 1, 2, \ldots\ldots n$.

u y_{ij} - $v'x_{ij}$ 0

   = tv,

$u =$ t u, t

(2)   (Dual Theory)

        .

min $_0$ (3)

   - y_{i0} + Y 0

   $_0 x_{i0}$ - X 0

            ($n \times 1$)   0

$_0$ DMU$_0$ 0   1

            1   .   (3)

  (k+m)   ,   (2)   n+1

                              (3)

   .45)

_____

45)   (2)   Multiplier   ,   (3)   Envelopment   .

.

.(Cummins, 1999)   ,

                                                                    .

                        ,   ,

                              .

        ,

                                                    .   , M&A

                                                                  .

        Cummins et al. (1999)   DEA   Malmquist   46)

                        M&A

            .47)

            ,   .

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46)   DMU$_0$

                              Malmquist   . Malmquist

            t+1   DMU$_{0,t+1}$ t

                              DMU$_{0,t}$

        (catching up effect)   t+1   t

                              (innovation)   .

        Malmquist   .

47)   M&A   (non-decreasing returns to

        scale),

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80%

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(equity capital)　　,

,　　　(physical capital)　　　　　.

.48)

(　　　)

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FY2000　　　8　　.

.49)   ,   ,

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                                                    .

                                                                                .

                                            .50)

                                                                    .

                        (intermediator)

            .

                                                                                <

    -1>   <   -2>   .

                                    2000
(deflate)   .
_____

49)

                                                    .

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                                                                    .

50)
                                Houston & Simon(1970), Colenutt(1977), Grace
        & Timme(1992), Hardwick(1994, 1997), Donni & Fecher(1997)   .

< Ⅳ-1>   ('98-'00   )

	( )	2,053,571	4,255,038	19,235,766	10,484
	( )	3,869,819	8,787,590	41,758,675	20,194
	( )	1,512	2,374	8,282	43
	( )	10,557	18,672	64,531	59
	( )	492,662	1,049,046	4,529,375	461
	( )	33.672	9.784	73.210	20.198
	( )	16.578	15.201	84.716	4.859
	( )	0.343	0.556	2.972	0.033

< Ⅳ-2>   ('98-'00   )

	( )	911,519	982,505	3,990,929	3,318
	( )	1,137,969	1,452,305	6,268,899	5,408
	( )	1,668	1,257	4,255	23
	( )	11,301	9,462	33,191	38
	( )	258,162	274,867	1,116,931	625
	( )	36.131	8.877	71.519	23.093
	( )	9.694	5.988	33.476	0.857
	( )	0.231	0.273	1.206	0.054

3.

DEA   <   -3>   .

(input-orientated measures)

.51)

VRS(variable returns to scale)   . <   -3>   1998

2000   (pure

technical efficiency),   ,   .52)

1998 , 1999 , 2000

0.611, 0.591, 0.582   .

40%   .

,

(Cummins et al.,1996).

. ,

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,   2000   . , 1999

2000   1998   1999

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51)

                                    (output-orientated

  measures)   ,   (constant returns to scale)

.

52)   (scale efficiency)

        , VRS   , CRS

  (constant returns to scale)   .

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<   IV-3>

	1998			1999			2000		
	PTE	AE	CE	PTE	AE	CE	PTE	AE	CE
L-A	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
L-B	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
L-C	0.563	0.995	0.560	0.558	0.992	0.553	1.000	1.000	1.000
L-D	0.928	0.992	0.920	0.608	0.943	0.574	1.000	0.995	0.995
L-E	0.688	1.000	0.688	0.722	1.000	0.722	0.899	0.795	0.715
L-F	0.815	0.840	0.685	0.582	0.836	0.486	0.732	0.920	0.673
L-G	0.492	0.999	0.491	0.465	0.890	0.414	0.643	1.000	0.643
L-H	0.969	0.876	0.848	0.829	0.917	0.759	0.624	0.993	0.620
L-I	0.613	0.952	0.584	0.653	1.000	0.653	0.613	1.000	0.613
L-J	0.620	0.998	0.619	0.694	0.887	0.616	0.808	0.689	0.557
L-K	0.514	0.890	0.458	0.589	0.880	0.519	0.477	0.961	0.458
L-L	0.857	0.834	0.714	0.652	0.860	0.561	0.457	0.994	0.455
L-M	0.515	0.822	0.424	0.644	0.666	0.428	0.852	0.510	0.435
L-N	1.000	0.684	0.684	1.000	0.565	0.565	0.495	0.854	0.423
L-O	0.585	0.630	0.369	0.541	0.718	0.388	0.502	0.841	0.422
L-P	0.848	0.884	0.750	1.000	0.760	0.760	0.426	0.978	0.417
L-Q	0.524	0.789	0.413	0.714	0.713	0.510	0.409	0.997	0.408
L-R	0.491	0.735	0.361	0.509	0.815	0.415	0.459	0.832	0.382
L-S	0.465	0.887	0.412	0.630	0.876	0.552	0.363	0.997	0.362
L-T	0.463	0.697	0.323	0.453	0.771	0.350	0.374	0.903	0.338
L-U	0.746	0.702	0.524	0.784	0.741	0.581	0.402	0.793	0.319
	0.700	0.867	0.611	0.696	0.849	0.591	0.645	0.907	0.582
	0.200	0.123	0.208	0.177	0.124	0.177	0.235	0.129	0.235

 : PTE   , AE   , CE   .

. Cummins et al.(1996)

, 1990 -1992

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(,(1999)).

(2001)

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. < -3> . , 0.5

1998 1999 8 , 6 2000

11 0.5 .

< Ⅳ-4>

	1998			1999			2000		
	TE	AE	CE	TE	AE	CE	TE	AE	CE
N-A	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
N-B	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
N-C	1.000	1.000	1.000	1.000	0.937	0.937	1.000	0.839	0.839
N-D	1.000	1.000	1.000	1.000	0.641	0.641	1.000	0.780	0.780
N-E	0.916	0.782	0.716	0.848	0.849	0.720	0.850	0.886	0.754
N-F	0.850	0.922	0.783	0.834	0.907	0.756	0.767	0.886	0.680
N-G	0.764	0.895	0.684	0.757	0.923	0.699	0.790	0.838	0.662
N-H	0.863	0.855	0.738	0.988	0.828	0.818	0.762	0.836	0.637
N-I	0.754	0.878	0.662	0.826	0.851	0.703	0.687	0.878	0.603
N-J	0.972	0.865	0.840	0.834	0.822	0.686	0.838	0.692	0.580
N-K	0.623	0.822	0.512	0.538	0.820	0.441	0.711	0.696	0.495
N-L	0.576	0.906	0.522	0.686	0.873	0.599	0.549	0.846	0.464
N-M	0.467	0.950	0.444	0.467	0.847	0.395	0.413	0.865	0.357
N-N	0.476	0.636	0.303	0.535	0.572	0.306	0.657	0.497	0.326
	0.804	0.894	0.729	0.808	0.848	0.693	0.787	0.824	0.656
	0.198	0.102	0.227	0.189	0.119	0.212	0.179	0.129	0.209

: PTE , AE , CE .

<   -4>   1998 -2000

DEA   .

VRS   (input-orientated VRS model)

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1998   , 1999   , 2000

0.729, 0.693, 0.656   .

30%

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2000

.   Cummins et al.(1996),   ·   (1999)

·   (2001)

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5%   30%

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5%   20%   .

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53),   90 %

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10%   ,   10 %

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53)   (integrative approach)
,   (specialist approach)   .

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< Ⅳ-5>   ('98-'00   )

	( )	2,053,571	4,255,038	19,235,766	10,484
	( )	3,869,819	8,787,590	41,758,675	20,194
	( )	1,512	2,374	8,282	43
	( )	9,502	16,804	58,078	53
	( )	1,056	1,867	6,453	6
	( )	443,396	944,141	4,076,438	415
	( )	33.672	9.784	73.210	20.198
	( )	16.578	15.201	84.716	4.859
	( )	14.920	13.681	76.244	4.373
	( )4	0.343	0.556	2.972	0.033

:   =10%,   =10%

< Ⅳ-6>   ('98-'00   )

	( )	911,519	982,505	3,990,929	3,318
	( )	1,137,969	1,452,305	6,268,899	5,408
	( )	1,668	1,257	4,255	23
	( )	10,171	8,516	29,872	34
	( )	1,130	946	3,319	4
	( )	232,346	247,380	1,005,238	563
	( )	36.131	8.877	71.519	23.093
	( )	9.694	5.988	33.476	0.857
	( )	8.725	5.390	30.129	0.771
	( )4	0.231	0.273	1.206	0.054

:   =10%,   =10%

<   -7>   <   -8>   10%   ,

  10%   ,

                            .(

                    <   >   .)

           <   Ⅳ-7>

	1998			1999			2000		
	PTE	AE	CE	PTE	AE	CE	PTE	AE	CE
L-A	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
L-B	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
L-C	0.638	0.657	0.419	1.000	0.681	0.681	1.000	1.000	1.000
L-D	0.928	0.766	0.711	0.608	0.860	0.523	1.000	1.000	1.000
L-E	1.000	0.750	0.750	1.000	0.728	0.728	1.000	0.885	0.885
L-F	0.817	0.605	0.495	0.597	0.491	0.293	0.732	0.614	0.450
L-G	0.492	0.833	0.410	0.465	0.790	0.367	0.643	0.829	0.533
L-H	0.969	0.426	0.412	0.872	0.472	0.412	0.624	0.751	0.469
L-I	0.783	0.835	0.654	0.850	0.802	0.682	0.913	0.718	0.655
L-J	0.681	0.797	0.543	0.926	0.929	0.860	1.000	1.000	1.000
L-K	0.571	0.936	0.535	0.713	0.957	0.683	0.812	0.752	0.610
L-L	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.851	0.851
L-M	0.659	0.931	0.614	0.843	0.918	0.774	1.000	0.927	0.927
L-N	1.000	1.000	1.000	1.000	0.825	0.825	0.516	0.876	0.452
L-O	0.721	0.888	0.640	0.746	0.886	0.661	0.795	0.774	0.616
L-P	0.848	0.987	0.837	1.000	0.978	0.978	0.476	0.976	0.465
L-Q	0.579	0.936	0.542	0.818	0.918	0.751	0456	0.950	0.434
L-R	0.560	0.896	0.501	0.611	0.918	0.560	0.700	0.774	0.542
L-S	0.468	0.963	0.451	0.630	0.970	0.611	0.437	0.899	0.393
L-T	0.504	0.916	0.462	0.548	0.870	0.476	0.562	0.737	0.414
L-U	0.933	0.930	0.868	1.000	1.000	1.000	0.669	0.764	0.511
	0.769	0.860	0.659	0.820	0.857	0.708	0.778	0.861	0.676
	0.195	0.150	0.213	0.182	0.154	0.219	0.212	0.116	0.238

  1:              =10%,   =10%   .
  2: PTE   , AE   , CE   .

<   Ⅳ-8>

	1998			1999			2000		
	PTE	AE	CE	PTE	AE	CE	PTE	AE	CE
N-A	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
N-B	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
N-C	1.000	1.000	1.000	1.000	0.921	0.921	1.000	0.831	0.831
N-D	1.000	1.000	1.000	1.000	0.630	0.630	1.000	0.746	0.746
N-E	0.916	0.773	0.708	0.848	0.841	0.713	0.851	0.881	0.749
N-F	0.850	0.916	0.779	0.834	0.903	0.753	0.767	0.884	0.678
N-G	0.764	0.891	0.681	0.757	0.921	0.698	0.790	0.839	0.663
N-H	0.863	0.852	0.735	0.988	0.819	0.809	0.762	0.827	0.631
N-I	0.754	0.871	0.657	0.826	0.846	0.699	0.687	0.874	0.601
N-J	0.972	0.858	0.834	0.834	0.814	0.679	0.838	0.686	0.575
N-K	0.623	0.810	0.505	0.538	0.808	0.434	0.711	0.685	0.487
N-L	0.577	0.901	0.519	0.686	0.871	0.597	0.549	0.840	0.461
N-M	0.468	0.939	0.439	0.467	0.839	0.391	0.413	0.854	0.353
N-N	0.476	0.628	0.299	0.535	0.564	0.302	0.657	0.486	0.319
	0.805	0.889	0.725	0.808	0.841	0.688	0.788	0.817	0.650
	0.198	0.105	0.228	0.189	0.121	0.212	0.179	0.133	0.209

1:              =10%,   =10%   .
2: PTE   , AE   , CE   .
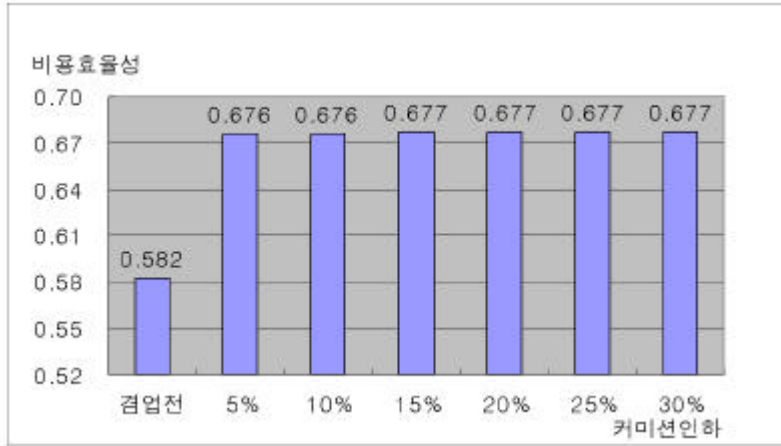

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        <   -1>   <   -2>   10%   ,

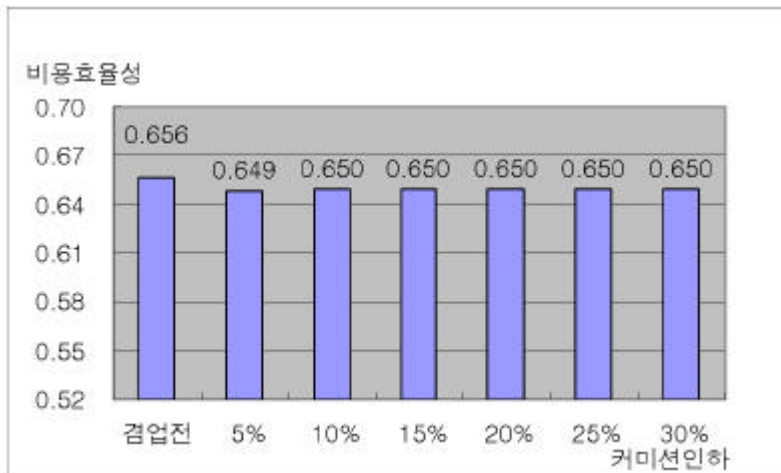   . <

            -1>   <   -2>

                                              .

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<   IV-2>

비용효율성

겸업전	5%	10%	15%	20%	25%	30%
0.582	0.676	0.676	0.677	0.677	0.677	0.677

커미션인하

: 2000   10%   .

<   IV-3>

비용효율성

0.656

겸업전	5%	10%	15%	20%	25%	30%
	0.649	0.650	0.650	0.650	0.650	0.650

커미션인하

: 2000   10%   .

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.54)

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54)   t

            2.276   5%   ,   t

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