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1.

가 ()

가 가

, (, R&D) (,)

OECD(1999b) (R&D)

가 (i) (high-technology industries),

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(ii) (medium-high-technology industries), (iii)
(medium-low-technology industries), (iv)
(low-technology industries)
가 OECD

2.

가
()
가
(technological sustainability) (sustainable
technological innovation) 가
, R&D ,
, 가
R&D
,
R&D
(spillover effects) R&D가
(technological
synergy effects) 가 R&D
,
가 , 가
가 , 가

R&D

가

R&D

가

OECD 가

40-66%

(< 1>

).

< 1>

가	(Performed)	(Acquired)	가	(Performed)	(Acquired)
	60%	40%		56%	44%
	52%	48%		60%	40%
	54%	46%		46%	54%
	40%	60%		34%	66%
	51%	49%		54%	46%

: OECD(1996), The OECD Input-Output Database.

1980-1990

(technology multipliers)²⁾

OECD 가

2) (technology multiplier)
 (total technology embodied)

(indirect

1.7- 1.9 (< 2 >).
가 가

< 2 >

가		(Technology multiplier)	가		(Technology multiplier)
	1972	1.5		1978	1.7
	1977	1.7		1986	1.7
	1982	1.7		1990	1.8
	1985	1.6			
	1990	1.7			
	1970	1.7		1972	1.7
	1975	2.0		1977	1.8
	1980	2.0		1980	1.8
	1985	1.9		1985	1.8
	1990	1.9		1990	1.7
	1979	1.6		1985	2.2
	1984	1.7		1990	-
	1990	1.8			
	1971	2.2		1974	2.3
	1976	2.6		1986	2.9
	1981	2.5		1990	-
	1986	2.6			
	1990	2.5			
	1972	1.6		1972	1.6
	1986	1.9		1977	1.7
	1990	2.0		1981	1.9
				1988	1.9

: OECD(1996), The OECD Input-Output Database.

가
· OECD
가
OECD 가 ³⁾ ,
,
가
(OECD, 1999a).
,
4)
가

3) , , , OECD 가 , , , ,

4) < 3 >

< 3>

가

가				
		29.8	21.2	1.4
	DAE	23.9	20.1	1.2
	ROW	11.6	16.2	0.7
	ROO	22.9	28.0	0.8
		18.3	7.0	2.6
		17.2	12.7	1.4
	DAE	57.8	27.7	2.1
		14.7	24.3	0.6
		7.6	7.5	1.0
		31.9	8.6	3.7
		20.1	21.1	1.0
	ROO	14.6	24.5	0.6
		20.0	9.5	2.1
	ROW	19.0	13.2	1.4
		14.8	17.3	0.9
		22.9	23.3	1.0
		20.5	6.7	3.0
	ROO	15.6	19.2	0.8
		75.2	67.1	1.1
		7.3	7.8	0.9
	DAE	5.4	6.5	0.8
		34.8	20.9	1.7
		23.6	23.7	1.0
		8.3	8.5	1.0
	ROO	27.8	29.3	0.9
		22.9	24.0	1.0
		12.6	5.9	2.1
		26.3	30.1	0.9
	ROO	22.5	26.8	0.8
		20.0	7.8	2.6

: OECD(1996), The OECD Input-Output Database.
 : DAE(Dynamic Asian Economies)
 , 6 , ROO < 3> , 10 , 가 , OECD
 가 , ROW OECD OECD 가 가 OECD .

3.

1) OECD

OECD 1980
가 . OECD
, 가
OECD 가
가 .
1984 OECD .
가 R&D ,
R&D . 10 OECD 가
.
,
가 . OECD
가 , (i)
, (ii)
, (iii)
.
OECD(1999b) 가 (i)
가가 R&D , (ii)
R&D , (iii) R&D
R&D 가
(< 4 >). 가 R&D
.
가
가

< 4> OECD

	1990			1980		
	dir+ind R&D	P&D- Prod.	R&D- V.A.	dir+ind R&D	P&D- Prod.	R&D- V.A.
(HT industries)	17.30	14.98	36.25	16.06	14.13	41.11
	9.40	8.03	18.65	9.33	8.35	18.43
(MHT industries)	6.55	5.10	11.19	4.69	3.61	8.63
	2.58	1.74	4.58	2.00	1.32	3.48
(MLT industries)	2.47	2.47	3.02	2.22	1.08	3.27
	1.10	0.64	2.48	0.78	0.45	1.71
(LT industries)	0.88	0.31	0.76	0.68	0.23	0.61
	0.65	0.18	0.47	0.55	0.14	0.39

: Hatzichronoglou(1997).

10 OECD 가 22 가

2)

R&D

R&D

Hatzichronoglou(1997)

j 가 i

R&D

(flows)

R&D .5)

$$(1) \quad r_{ij}^d = \frac{x_j^d}{x_j} \cdot \frac{r_i}{x_i} = a_{ij}^d \cdot rc_i$$

x_j^d j i , r_i

i R&D , x_i x_j i j

, a_{ij}^d j (technical coefficients) , rc_i

i R&D , R&D

$$(2) \quad rv_{ij}^d = \frac{v_j^d}{x_j} \cdot \frac{r_i}{x_i} = va_{ij}^d \cdot rc_i$$

v_j^d j i

, va_{ij}^d va_{ij}^d (capital formation)

R&D

5) Hatzichronoglou (1997) R&D
R&D

. (1) (2)

R&D

$$(3) \quad ri_{ij}^m = \frac{x_{ij}^m}{x_j} \cdot \left(\sum_k \omega_{ik} \frac{r_{ik}}{x_{ik}} \right) = a_{ij}^m \cdot \left(\sum_k \omega_{ik} \cdot rc_{ik} \right)$$

$$(4) \quad rv_{ij}^m = \frac{v_{ij}^m}{x_j} \cdot \left(\sum_k \omega_{ik} \frac{r_{ik}}{x_{ik}} \right) = va_{ij}^m \cdot \left(\sum_k \omega_{ik} rc_{ik} \right)$$

x_{ij}^m j i , v_{ij}^m
 j i , x_{ik} k i
, r_{ik} k i R&D . ω_{ik} i

(1)-(4)

$$(5) \quad rt_j = r_j + \sum_l \sum_i (ri_{ij}^l + rv_{ij}^l); \quad l = d, m$$

가

(knowledge flow)

(knowledge stock)

R&D

R&D

R&D

R&D

가

(

, ,) .

a_{ij} , $(I - A)^{-1}$, b_{ij}

(Leontief) , 가

, j 가 가 i

가 가 가 .

(1)- (4) (interindustrial ripple effects)가

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, ,

, ,

(R&D)

, , (1)- (4)

가

,

(interdependency coefficient)

,

가 . Miller and Blair(1985, p.328)

(on-diagonal elements)

$$(6) \quad a_{ij}^* = \frac{a_{ij}}{a_{jj}} = [\Delta X_i / \Delta Y_j] / [\Delta X_j / \Delta Y_j] = \Delta X_i / \Delta X_j$$

$$[b_{ij}^*] = (I - A^*)^{-1}$$

R&D

$$(7) \quad tri_{ij}^d = b_{ij}^{d*} \cdot rc_i$$

R&D

가

R&D

가

$$(8) \quad trv_{ij}^d = b_{ij}^d \cdot va_{ij}^d \cdot rc_i$$

가

가

$$(9) \quad tri_{ij}^m = a_{ij}^m \cdot \left(\sum_k \omega_{ik} \cdot \xi_{i \sim k} \cdot rc_{ik} \right)$$

$$(10) \quad trv_{ij}^m = va_{ij}^m \cdot \left(\sum_k \omega_{ik} \cdot \xi_{i \sim k} \cdot rc_{ik} \right)$$

r_j

(7)-(10)

$$(11) \quad trt_j = r_j + \sum_l \sum_{i,j} (tri_{ij}^l + trv_{ij}^l); \quad l = d, m$$

4.

1) (technology balance in trade)

가 .

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가

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(i)

, (ii)

, (iii)

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가

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가

가

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가

가

가

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2)

3

가?

가

가

(backward linkage effects)
linkage effects) .6)

(forward

3

가

7) (direct output coefficients)가

가

R&D

가

가

가

가

8)

6) (demand- side) (supply - side)

7) (technical coefficients)
(direct input coefficients)

가 () , ,
가 . ,
가가 GDP
()
가
가
가
가 . ,
가 .

8) 가

가
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