

No 55 2007 11

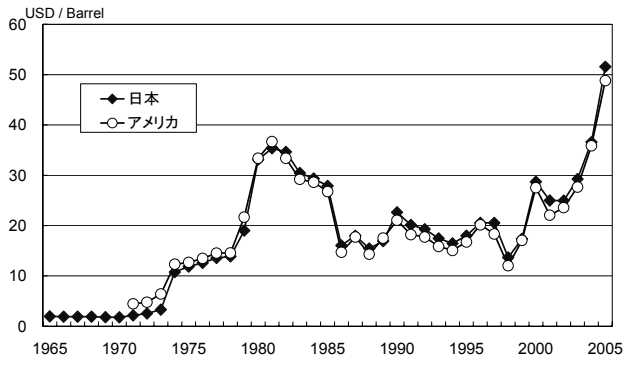
輸入原油価格の国内価格波及に関する日米比較

A comparative analysis on ripple effect of imported oil price hike in domestic prices between Japan and the USA

2000年以降原油価格は上昇を続け、2006年には1バレル70ドルという歴史的な高値にまで高騰した。しかし、今回の原油価格高騰は、各国に石油ショック時のようなパニックを引き起こさなかった。その一因として、石油ショック以降、先進各国は原油をはじめとする資源節約技術の開発に努めてきたことが挙げられる。本稿では、国内経済の輸入原油集約度および国内物価の輸入原油価格感応度という2つの指標を用いて、輸入原油価格の変化が国内物価にどの程度の影響を与えるかシミュレーションを行い、日本とアメリカにおける長期での技術構造変化を比較する。

分析の結果から次のようなことが確認された。日米とも、輸入原油集約度は、石油ショック直後に急速に低下したが、1980年代の後半になると、日本ではほぼ横ばいとなり、アメリカではやや上昇に転じさえしている。ただ、両国でそうした変化の要因は異なる。日本では輸入原油投入率の低下と国内の投入構造の効率化が同時に起こったが、アメリカの場合は国内の生産構造効率化はあまり進展しなかった。輸入原油価格の国内物価への波及をみると、日本では石油ショック直後はその影響はきわめて大きかった。しかしその後、国内物価の輸入原油価格に対する感応度は、石油ショック前と同水準まで劇的に低下した。アメリカは、日本に比べて、そもそも輸入原油価格の国内物価への影響はきわめて限定的であることがわかった。

		3.1
1.1		3.2
1.2		3.3
		4.1
2.1		4.2
2.2		
1.		
1.1		
1	(CIF	
)	1970	1
2		1980
	1	35
	1973	1
1979	2	
	(OPEC)	
		1 1974



2007

図1 日米の原油輸入 CIF 価格

OPEC

1985

1

20

2000

1980

2

()

2

(2005)

(2005)

(2005)

2

OECD
GDP

1971

420(toe/100)

2004

6

245(toe/100)

OECD

1971

237

157

3

2

1971

205

154

4

3

GDP

()

(

)

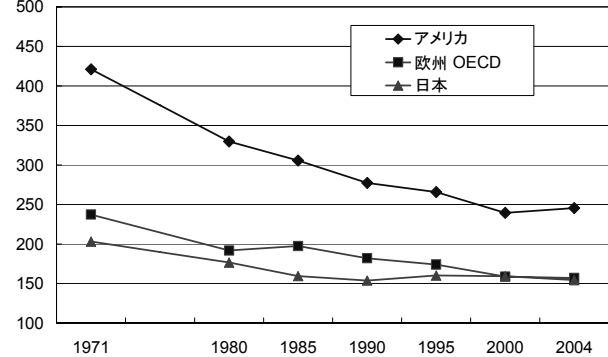
(

)

(

)

(toe / Million USD at 2000 price)



2007

図2 GDP あたり一次エネルギー消費

INFORUM

3

2004

2

36.4

2005

50.7

(39.3%)

GDP

1

0.32% 0.87%

GDP

0.48 0.65

0.022(=0.87/39.3)

(2006)

2

(1978 ~1981)

125.1%

19.1%

8.0%

9.2%

0.074(=9.2/125.1)

(2002

~2005)

1.2

62.2%

1.9%

-0.2%

1.5%

0.024(=1.5/62.2) 3 1

(1993) 1980

25

1% ()

4

1980

(2005)

0.09

1988

0.03

3

1990

0.04

INFORUM

1980

4

(2005)

(2004

1

25

100

2005a 2005b)

1%

(

1977	0.0700	1982	0.1049
1987	0.0380	1992	0.0375
1987	0.0334	1982	87

2004

()

$$\mathbf{m} \quad (2)$$

MA

$$\mathbf{m} = \mathbf{MAx} = \mathbf{MABf}_d \quad (2)$$

$(\bar{\mathbf{f}}_d)$

$$(1, \dots, 1)\bar{\mathbf{f}}_d = \mathbf{1}\bar{\mathbf{f}}_d = 1 \quad (3)$$

1

$(\bar{\mathbf{x}})$

$(\bar{\mathbf{m}})$

$$\bar{\mathbf{x}} = \mathbf{B}\bar{\mathbf{f}}_d \quad (4)$$

$$\bar{\mathbf{m}} = \mathbf{MA}\bar{\mathbf{x}} = \mathbf{MAB}\bar{\mathbf{f}}_d \quad (5)$$

$\bar{\mathbf{m}}$

2.

5

2.1

(1)	\mathbf{f}	\mathbf{f}_d	$\bar{\mathbf{m}}$	0	1
B			(6a)	(6f)	
()	\mathbf{x}				

M

e

I

$$\mathbf{x} = [\mathbf{I} - (\mathbf{I} - \mathbf{M})\mathbf{A}]^{-1}[(\mathbf{I} - \mathbf{M})\mathbf{f} + \mathbf{e}] = \mathbf{B}\mathbf{f}_d$$

$$\begin{aligned} d\bar{m} = \bar{m}(1) - \bar{m}(0) &= [\mathbf{M}(1)\mathbf{A}(1) - \mathbf{M}(0)\mathbf{A}(0)]\mathbf{B}(1)\bar{\mathbf{f}}(1) \\ &+ \mathbf{M}(0)\mathbf{A}(0)[\mathbf{B}(1) - \mathbf{B}(0)]\bar{\mathbf{f}}(1) + \mathbf{M}(0)\mathbf{A}(0)\mathbf{B}(0)[\bar{\mathbf{f}}(1) - \bar{\mathbf{f}}(0)] \end{aligned} \quad (6a)$$

$$\begin{aligned} d\bar{m} = \bar{m}(1) - \bar{m}(0) &= [\mathbf{M}(1)\mathbf{A}(1) - \mathbf{M}(0)\mathbf{A}(0)]\mathbf{B}(0)\bar{\mathbf{f}}(1) \\ &+ \mathbf{M}(1)\mathbf{A}(1)[\mathbf{B}(1) - \mathbf{B}(0)]\bar{\mathbf{f}}(1) + \mathbf{M}(0)\mathbf{A}(0)\mathbf{B}(0)[\bar{\mathbf{f}}(1) - \bar{\mathbf{f}}(0)] \end{aligned} \quad (6b)$$

$$\begin{aligned} d\bar{m} = \bar{m}(1) - \bar{m}(0) &= [\mathbf{M}(1)\mathbf{A}(1) - \mathbf{M}(0)\mathbf{A}(0)]\mathbf{B}(1)\bar{\mathbf{f}}(0) \\ &+ \mathbf{M}(0)\mathbf{A}(0)[\mathbf{B}(1) - \mathbf{B}(0)]\bar{\mathbf{f}}(0) + \mathbf{M}(1)\mathbf{A}(1)\mathbf{B}(1)[\bar{\mathbf{f}}(1) - \bar{\mathbf{f}}(0)] \end{aligned} \quad (6c)$$

$$\begin{aligned} d\bar{m} = \bar{m}(1) - \bar{m}(0) &= [\mathbf{M}(1)\mathbf{A}(1) - \mathbf{M}(0)\mathbf{A}(0)]\mathbf{B}(0)\bar{\mathbf{f}}(0) \\ &+ \mathbf{M}(1)\mathbf{A}(1)[\mathbf{B}(1) - \mathbf{B}(0)]\bar{\mathbf{f}}(0) + \mathbf{M}(1)\mathbf{A}(1)\mathbf{B}(1)[\bar{\mathbf{f}}(1) - \bar{\mathbf{f}}(0)] \end{aligned} \quad (6d)$$

$$\begin{aligned} d\bar{m} = \bar{m}(1) - \bar{m}(0) &= [\mathbf{M}(1)\mathbf{A}(1) - \mathbf{M}(0)\mathbf{A}(0)]\mathbf{B}(1)\bar{\mathbf{f}}(1) \\ &+ \mathbf{M}(0)\mathbf{A}(0)[\mathbf{B}(1) - \mathbf{B}(0)]\bar{\mathbf{f}}(0) + \mathbf{M}(0)\mathbf{A}(0)\mathbf{B}(1)[\bar{\mathbf{f}}(1) - \bar{\mathbf{f}}(0)] \end{aligned} \quad (6e)$$

$$\begin{aligned} d\bar{m} = \bar{m}(1) - \bar{m}(0) &= [\mathbf{M}(1)\mathbf{A}(1) - \mathbf{M}(0)\mathbf{A}(0)]\mathbf{B}(0)\bar{\mathbf{f}}(0) \\ &+ \mathbf{M}(1)\mathbf{A}(1)[\mathbf{B}(1) - \mathbf{B}(0)]\bar{\mathbf{f}}(1) + \mathbf{M}(1)\mathbf{A}(1)\mathbf{B}(0)[\bar{\mathbf{f}}(1) - \bar{\mathbf{f}}(0)] \end{aligned} \quad (6f)$$

(6a) (6f)

(7)

$$\begin{aligned} d\bar{m} &= [\mathbf{M}(1)\mathbf{A}(1) - \mathbf{M}(0)\mathbf{A}(0)][2\mathbf{B}(0)\bar{\mathbf{f}}(0) + \mathbf{B}(1)\bar{\mathbf{f}}(0) + \mathbf{B}(0)\bar{\mathbf{f}}(1) + 2\mathbf{B}(1)\bar{\mathbf{f}}(1)]/6 \\ &+ [[2\mathbf{M}(0)\mathbf{A}(0) + \mathbf{M}(1)\mathbf{A}(1)][\mathbf{B}(1) - \mathbf{B}(0)]\bar{\mathbf{f}}(0) \\ &+ [\mathbf{M}(0)\mathbf{A}(0) + 2\mathbf{M}(1)\mathbf{A}(1)][\mathbf{B}(1) - \mathbf{B}(0)]\bar{\mathbf{f}}(1)]/6 \\ &+ [[2\mathbf{M}(0)\mathbf{A}(0)\mathbf{B}(0) + \mathbf{M}(1)\mathbf{A}(1)\mathbf{B}(0) + \mathbf{M}(0)\mathbf{A}(0)\mathbf{B}(1) + 2\mathbf{M}(1)\mathbf{A}(1)\mathbf{B}(1)][\bar{\mathbf{f}}(1) - \bar{\mathbf{f}}(0)]/6 \end{aligned} \quad (7)$$

$$\begin{aligned} (7) \quad & 1 \quad \quad \quad 2.2 \\ & 2 \quad \quad \quad 3 \\ & 2 \quad \quad \quad \mathbf{v}_d \quad \quad \quad (\quad 1 \\ & \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \mathbf{p}_m \end{aligned}$$

$$\mathbf{v}_m = \mathbf{p}_m \mathbf{M} \mathbf{A} \quad (8)$$

(9)

 \mathbf{p}_d

$$\mathbf{p}_d = [\mathbf{v}_d + \mathbf{p}_m \mathbf{M} \mathbf{A}] [\mathbf{I} - (\mathbf{I} - \mathbf{M}) \mathbf{A}]^{-1} = [\mathbf{v}_d + \mathbf{v}_m] \mathbf{B}_d \quad (9)$$

pa

$$\bar{p}_d = \bar{p}_m \mathbf{MAB}_d \quad (10)$$

$$\bar{p}_d = \bar{p}_m \mathbf{MAB}_d \quad (11a) \quad 0 \quad 1$$

$$\bar{p}_d = \bar{p}_m \mathbf{MAB}_d \quad (11f)$$

$$\bar{p}_d = \bar{p}_m \mathbf{MAB}_d \quad (10)$$

$$d\bar{p}_d = \bar{p}_d(1) - \bar{p}_d(0) = [\bar{p}_m(1) - \bar{p}_m(0)]\mathbf{M(0)A(0)B}_d(0) + \bar{p}_m(1)[\mathbf{M(1)A(1) - M(0)A(0)}]\mathbf{B}_d(0) + \bar{p}_m(1)\mathbf{M(1)A(1)}[\mathbf{B}_d(1) - \mathbf{B}_d(0)] \quad (11a)$$

$$d\bar{p}_d = \bar{p}_d(1) - \bar{p}_d(0) = [\bar{p}_m(1) - \bar{p}_m(0)]\mathbf{M(1)A(1)B}_d(0) + \bar{p}_m(0)[\mathbf{M(1)A(1) - M(0)A(0)}]\mathbf{B}_d(0) + \bar{p}_m(1)\mathbf{M(1)A(1)}[\mathbf{B}_d(1) - \mathbf{B}_d(0)] \quad (11b)$$

$$d\bar{p}_d = \bar{p}_d(1) - \bar{p}_d(0) = [\bar{p}_m(1) - \bar{p}_m(0)]\mathbf{M(1)A(1)B}_d(1) + \bar{p}_m(0)[\mathbf{M(1)A(1) - M(0)A(0)}]\mathbf{B}_d(1) + \bar{p}_m(0)\mathbf{M(0)A(0)}[\mathbf{B}_d(1) - \mathbf{B}_d(0)] \quad (11c)$$

$$d\bar{p}_d = \bar{p}_d(1) - \bar{p}_d(0) = [\bar{p}_m(1) - \bar{p}_m(0)]\mathbf{M(0)A(0)B}_d(1) + \bar{p}_m(1)[\mathbf{M(1)A(1) - M(0)A(0)}]\mathbf{B}_d(1) + \bar{p}_m(0)\mathbf{M(0)A(0)}[\mathbf{B}_d(1) - \mathbf{B}_d(0)] \quad (11d)$$

$$d\bar{p}_d = \bar{p}_d(1) - \bar{p}_d(0) = [\bar{p}_m(1) - \bar{p}_m(0)]\mathbf{M(1)A(1)B}_d(1) + \bar{p}_m(0)[\mathbf{M(1)A(1) - M(0)A(0)}]\mathbf{B}_d(0) + \bar{p}_m(0)\mathbf{M(1)A(1)}[\mathbf{B}_d(1) - \mathbf{B}_d(0)] \quad (11e)$$

$$d\bar{p}_d = \bar{p}_d(1) - \bar{p}_d(0) = [\bar{p}_m(1) - \bar{p}_m(0)]\mathbf{M(0)A(0)B}_d(1) + \bar{p}_m(1)[\mathbf{M(1)A(1) - M(0)A(0)}]\mathbf{B}_d(1) + \bar{p}_m(1)\mathbf{M(0)A(0)}[\mathbf{B}_d(1) - \mathbf{B}_d(0)] \quad (11f)$$

$$(11a) \quad (11f) \quad 1 \quad 1$$

$$6 \quad 2$$

$$3 \quad 2$$

$$(11a) \quad (11f) \quad 6$$

$$(12)$$

$$\mathbf{w(1)\bar{p}_d(1) - w(0)\bar{p}_d(0)} = [\mathbf{w(1) - w(0)}][\bar{p}_d(0) + \bar{p}_d(1)]/2 + [\mathbf{w(0) + w(1)}][\bar{p}_d(1) - \bar{p}_d(0)]/2 \quad (12)$$

$$\begin{aligned}
 w(1)\bar{p}_d(1) - w(0)\bar{p}_d(0) &= [w(1) - w(0)][\bar{p}_d(0) + \bar{p}_d(1)]/2 \\
 &+ [w(1) - w(0)][\bar{p}_m(1) - \bar{p}_m(0)][2M(0)A(0)B_d(0) + M(1)A(1)B_d(0) \\
 &\quad + M(0)A(0)B_d(1) + 2M(1)A(1)B_d(1)]/12 \\
 &+ [w(1) - w(0)][2\bar{p}_m(0) + \bar{p}_m(1)][M(1)A(1) - M(0)A(0)]B_d(0) \\
 &\quad + [\bar{p}_m(0) + 2\bar{p}_m(1)][M(1)A(1) - M(0)A(0)]B_d(1)]/12 \\
 &+ [w(1) - w(0)][2\bar{p}_m(0)M(0)A(0) + \bar{p}_m(1)M(0)A(0) \\
 &\quad + \bar{p}_m(0)M(1)A(1) + 2\bar{p}_m(1)M(1)A(1)][B_d(1) - B_d(0)]/12
 \end{aligned}
 \tag{13}$$

(13)

1972
SNA(System of National Accounts)
SNA

3.

1 1

3.1

2

SNA

1

2

2

×

1955

1

5

0

1947

1

7

2

(

)

3.2

3

3

10

3

1

()

() 1960

1%

45

1973

3

1960-65-70

3%

1973~99

(1990

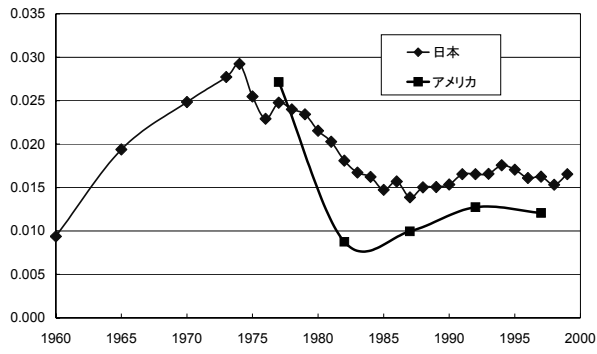


図3 日米の輸入原油集約度の推移

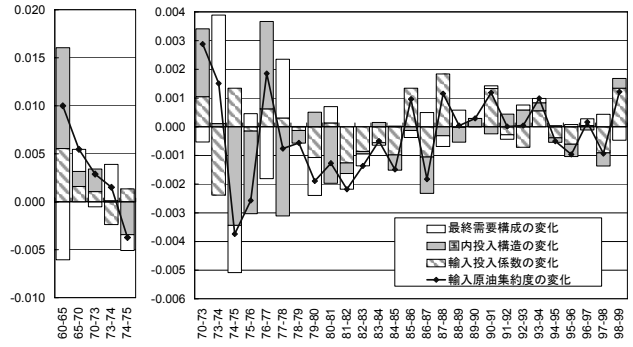


図4 日本の輸入原油集約度変化の要因分解

1985 2% 1999 1

()

1977 1982

2.7% 0.9%

1992 (0.18%)

1.2%

80 80

(-0.17%) (0.10%)

5

1977~82

3.3

4

3

7 80

7 DPG(2002 8.38Km/l

73 85

-1.30%

(-0.90%)

(-0.50%)

) 2

(0.11%)

1980

(0.25%)⁸

(-0.17%)

(0.10%)

5

1977~82

(1999) 1960-70 100

± 100(-100) 10.6 14.3 12.1 -47.4 -1.0 13.7

-2.3 6.1

4.9 8 2004 1

2002 1989 9.46Km/l

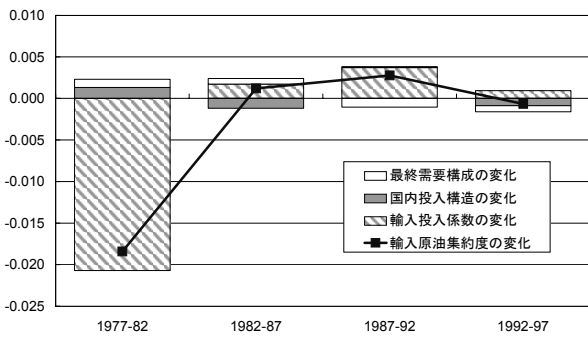


図5 アメリカの輸入原油集約度変化の要因分解

4

4.1

6

100% (

)

()

() 1973

0.014

1

1974

0.198

1975

1979

0.05

(0.0473

0.0467

0.0466

0.0450

0.0444)

2

1980

0.075

1980

1986

0.02

1970

0.02

(2005)

(2006)

3%

9 DPG

(1999)

100

1970

80

-13.3()

11.8

22.9

-20.5()

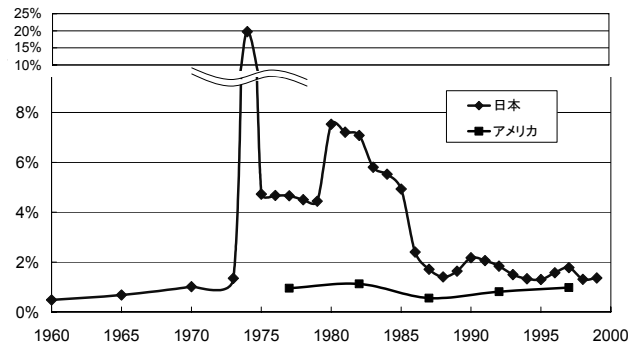


図6 国内物価の輸入原油価格感応度 (原油価格 100%上昇)

(■)

1977	0.0095	1982	0.0112	1987
0.0056	1992	0.0081	1997	0.0098

10

11

(2005)

1977	0.070	1982	0.1049	1987
0.0380	1992	0.0375	1997	0.0334

3

(2005)

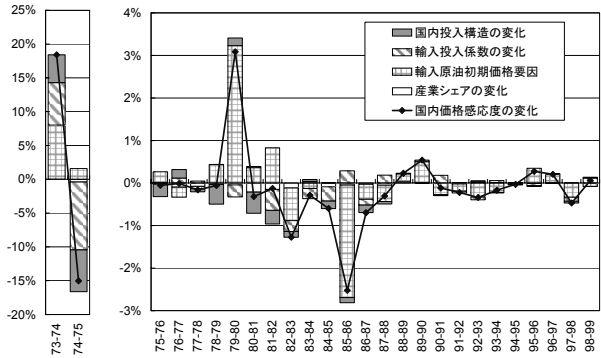


図7 国内物価の輸入原油価格感応度の変化の要因分析(100%上昇、日本)

1973 74

1974

1974 75

4.2

7 1

2

1980

6

79~80 81~82

1980

10 OECD (2006)

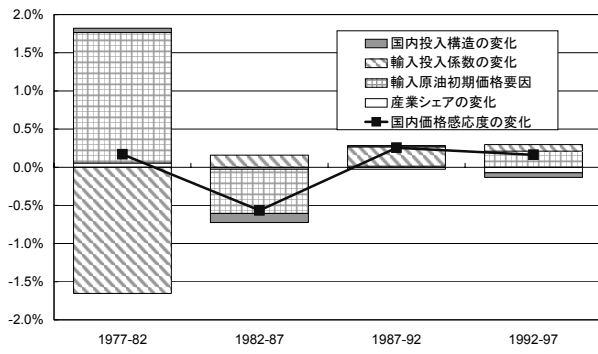
8

OECD 1972 0.004 1977 0.019

11

()

1977-82



1

図 8 「国内物価の輸入原油価格感応度」変化の要因 (100%上昇、アメリカ)

2

5.

()
()

2

-OECD

(2006)

- &I-O -
14 2 2
(2004)

No.58

<http://www.iti.or.jp/kikan58/58ono.pdf>
(2005a)
(2)

No.60

<http://www.iti.or.jp/kikan60/60ono.pdf>
(2005b)
(3)

No.62

<http://www.iti.or.jp/kikan62/62ono.pdf>
(2005) 2005 1 4

http://www.meti.go.jp/report/tsuhaku2005/2005_honbun_p/2005_0104.pdf
(2005)

2005 9

<http://www.jetro.go.jp/jpn/reports/05001019>.
(2005)

() Vol26 No.6

<http://www.rieti.go.jp/jp/papers/contribution/hayashi/02.html>
(1993)

- &I-O -
4 1
(2006)

-2002

Y05013

(2005) GDP

ESRI Discussion Paper Series No.142

Klein, L. R., V. G. Duggal and C. Saltzman,(2005)“The Sensitivity of the General Price Level to Changes in the Price of Crude Oil”, *Business Economics*, October 2005, pp.74-77.

2006 3
() 2006 7
() 2006 10
()

付録1 アメリカの産業連関表

$$U = B\hat{Q} \tag{A-2}$$

A-1 技術仮定

$$\begin{matrix} & & 10 \\ \times & & \\ & V & (\quad) \\ & & U & (\quad) \end{matrix}$$

2

$$\begin{matrix} & & 1972 & & \text{SNA} \\ & V & & U & \\ & & & \times & \\ & & & & \text{SNA} \end{matrix}$$

$$D_{ij} = V_{ij} / x_j$$

\hat{X}

$$V = D\hat{X} \tag{A-3}$$

V

$$q = \hat{Q}t = Vt \tag{A-4}$$

(A-1)

$$x = Ut + f = B\hat{Q}t + f = BVt + f = BDx + f \tag{A-5}$$

SNA

2

U

V

$$x = (I - BD)^{-1}f \tag{A-5'}$$

付論の図 SNA方式の産業連関表

		U	f	x
	V			q
		y'		
	x'	q'		

SNA

2

v

1

$$x = Ut + f \tag{A-1}$$

$$B_{ij} = U_{ij} / q_j$$

\hat{Q}

q_j

Df

$$\begin{aligned} q &= Dx \\ &= D(I - BD)^{-1}f \\ &= D(I - BD)^{-1}D^{-1}Df \\ &= D[D(I - BD)]^{-1}D \\ &= D(D - DBD)^{-1}Df \\ &= [(D - DBD)D^{-1}]^{-1}Df \\ &= (I - DB)^{-1}Df \end{aligned} \tag{A-6}$$

A-2 実質表の作成と部門統合

$$C_{ji} = V_{ij} / q_i$$

$$V' = C\hat{Q} \quad (A-7)$$

Web (https://www.bea.gov/Industry/ Index.htm) 1977 82 87
 92 1997
 1977 82 79
 87 90 92 97 91

$$x = V'u \quad (A-8)$$

(A-1)

$$x = Uu + f = BQu + f = BC^{-1}V'u + f = BC^{-1}x + f \quad (A-9)$$

$$x = (I - BC^{-1})^{-1}f \quad (A-9')$$

Web 92 2000
 Web

1987
 Web
 1977 92 (2000)

$$\begin{aligned} q &= C^{-1}x \\ &= C^{-1}(I - BC^{-1})^{-1}f \\ &= [(I - BC^{-1})C]^{-1}f \\ &= [CC^{-1}(I - BC^{-1})C]^{-1}f \\ &= [C(I - C^{-1}B)]^{-1}f = (I - C^{-1}B)^{-1}C^{-1}f \end{aligned} \quad (A-10)$$

1977 82
 1) 87 82
 2) 87 77
 87
 82 77

×
 × 1977 90
 2000

C ()
 C

“ North American Industry Classification System (NAICS)”

“ Standard Industrial Classification (SIC)”

Web (<http://www.census.gov/epcd/www/naics.html>) NAICS

SIC

38
3
1977 82 ()
38 1987 92 97 () 44

) Transportation and warehousing()

Transportation and warehousing
Air transportation 5

Transportation and warehousing 1 5

) Educational services, health care, and social assistance() 44

Health, educational, and social services and nonprofit organization

Educational and social services, and membership organizations Health services 2

Health, educational, and social services and nonprofit organization

1 2

) Wholesale and retail trade()

Wholesale trade Retail trade
2

Wholesale

trade Retail trade
Wholesale and retail trade 1
Wholesale trade Retail trade

Wholesale and retail trade))

Wholesale and retail trade 1

Wholesale trade Retail trade
Web

(Gross Output by Industry)

Wholesale and Retail trade

1987 38 44

1987 92 97 44

38

	1977 1982	1987	1992 1997
1 Farms	1 Livestock and livestock 2 Other agricultural products	1 Livestock and livestock 2 Other agricultural products	1 Livestock and livestock 2 Other agricultural products
2 Forestry, fishing, and related activities	3 Forestry and fishery products 4 Agricultural, forestry, and fishery services	3 Forestry and fishery products 4 Agricultural, forestry, and fishery services	3 Forestry and fishery products 4 Agricultural, forestry, and fishery services
3 Oil and gas extraction	8 Crude petroleum and natural gas	8 Crude petroleum and natural gas	8 Crude petroleum and natural gas
4 Mining, except oil and gas	5 Iron and ferroalloy ores mining 6 Nonferrous metal ores mining 7 Coal mining 9 Stone and clay mining and quarrying 10 Chemical and fertilizer mineral mining	5+6 Metallic ores mining 7 Coal mining 9+10 Nonmetallic minerals mining	05+06 Metallic ores mining 7 Coal mining 09+10 Nonmetallic minerals mining
5 Utilities	68 Private electric, gas, water, and sanitary services	68A Electric services (utilities) 68B Gas production and distribution (utilities) 68C Water and sanitary services	68A Electric services (utilities) 68B Gas production and distribution (utilities) 68C Water and sanitary services
6 Construction	11 New construction 12 Repair and maintenance construction	11+12 Construction	11 New construction 12 Maintenance and repair construction
7 Wood products	20 Lumber and wood products, except containers 21 Wood containers	20+21 Lumber and wood products	20+21 Lumber and wood products
8 Nonmetallic mineral products	35 Glass and glass products 36 Stone and clay products	35 Glass and glass products 36 Stone and clay products	35 Glass and glass products 36 Stone and clay products
9 Primary metals	37 Primary iron and steel manufacturing 38 Primary nonferrous metals manufacturing	37 Primary iron and steel manufacturing 38 Primary nonferrous metals manufacturing	37 Primary iron and steel manufacturing 38 Primary nonferrous metals manufacturing
10 Fabricated metal products	13 Ordnance and accessories 39 Metal containers 40 Heating, plumbing, and fabricated structural metal 41 Screw machine products and stampings 42 Other fabricated metal products	13 Ordnance and accessories 39 Metal containers 40 Heating, plumbing, and fabricated structural metal 41 Screw machine products and stampings 42 Other fabricated metal products	13 Ordnance and accessories 39 Metal containers 40 Heating, plumbing, and fabricated structural metal 41 Screw machine products and stampings 42 Other fabricated metal products
11 Machinery	43 Engines and turbines 44 Farm and garden machinery 45 Construction and mining machinery 46 Materials handling machinery and equipment 47 Metalworking machinery and equipment 48 Special industry machinery and equipment 49 General industrial machinery and equipment 50 Miscellaneous machinery, except electrical 52 Service industry machines	43 Engines and turbines 44+45 Farm, construction, and mining machinery 46 Materials handling machinery and equipment 47 Metalworking machinery and equipment 48 Special industry machinery and equipment 49 General industrial machinery and equipment 50 Miscellaneous machinery, except electrical 51 Service industry machinery	43 Engines and turbines 44+45 Farm, construction, and mining machinery 46 Materials handling machinery and equipment 47 Metalworking machinery and equipment 48 Special industry machinery and equipment 49 General industrial machinery and equipment 50 Miscellaneous machinery, except electrical 52 Service industry machinery
12 Computer and electronic products	51 Office, computing, and accounting machines 56 Radio, TV, and communication equipment 57 Electronic components and accessories	52 Computer and office equipment 56 Audio, video, and communication equipment 57 Electronic components and accessories	51 Computer and office equipment 56 Audio, video, and communication equipment 57 Electronic components and accessories
13 Electrical equipment, appliances, and components	53 Electric industrial equipment and apparatus 54 Household appliances 55 Electric lighting and wiring equipment 58 Miscellaneous electrical machinery and supplies	53 Electrical industrial equipment and apparatus 54 Household appliances 55 Electric lighting and wiring equipment 58 Miscellaneous electrical machinery and supplies	53 Electrical industrial equipment and apparatus 54 Household appliances 55 Electric lighting and wiring equipment 58 Miscellaneous electrical machinery and supplies
14 Motor vehicles, bodies and trailers, and parts	59 Motor vehicles and equipment	59A Motor vehicles (passenger cars and trucks) 59B Truck and bus bodies, trailers, and motor vehicles parts	59A Motor vehicles (passenger cars and trucks) 59B Truck and bus bodies, trailers, and motor vehicles parts
15 Other transportation equipment	60 Aircraft and parts 61 Other transportation equipment	60 Aircraft and parts 61 Other transportation equipment	60 Aircraft and parts 61 Other transportation equipment

	1977 1982	1987	1992 1997
16 Furniture and related products	22 Household furniture 23 Other furniture and fixtures	22+23 Furniture and fixtures	22+23 Furniture and fixtures
17 Miscellaneous manufacturing	33 Leather tanning and finishing 34 Footwear and other leather products 62 Scientific and controlling instruments 63 Optical, ophthalmic, and photographic equipment 64 Miscellaneous manufacturing	33+34 Footwear, leather, and leather products 62 Scientific and controlling instruments 63 Ophthalmic and photographic equipment 64 Miscellaneous manufacturing	33+34 Footwear, leather, and leather products 62 Scientific and controlling instruments 63 Ophthalmic and photographic equipment 64 Miscellaneous manufacturing
18 Food and beverage and tobacco products	14 Food and kindred products 15 Tobacco manufactures	14 Food and kindred products 15 Tobacco products	14 Food and kindred products 15 Tobacco products
19 Textile mills and textile product mills	16 Broad and narrow fabrics, yarn and thread mills 17 Miscellaneous textile goods and floor coverings 18 Apparel	16 Broad and narrow fabrics, yarn and thread mills 17 Miscellaneous textile goods and floor coverings 18 Apparel	16 Broad and narrow fabrics, yarn and thread mills 17 Miscellaneous textile goods and floor coverings 18 Apparel
20 Apparel and leather and allied products	19 Miscellaneous fabricated textile products	19 Miscellaneous fabricated textile products	19 Miscellaneous fabricated textile products
21 Paper products	24 Paper and allied products, except containers 25 Paperboard containers and	24 Paper and allied products, except containers 25 Paperboard containers and	24 Paper and allied products, except containers 25 Paperboard containers and
22 Petroleum and coal products	31 Petroleum refining and related industries	31 Petroleum refining and related products	31 Petroleum refining and related products
23 Chemical products	27 Chemicals and selected chemical products 29 Drugs, cleaning and toilet preparations 30 Paints and allied products	27A Industrial and other chemicals 27B Agricultural fertilizers and chemicals 29A Drugs 29B Cleaning and toilet preparations 30 Paints and allied products	27A Industrial and other chemicals 27B Agricultural fertilizers and chemicals 29A Drugs 29B Cleaning and toilet preparations 30 Paints and allied products
24 Plastics and rubber products	28 Plastics and synthetic materials 32 Rubber and miscellaneous plastics products	28 Plastics and synthetic materials 32 Rubber and miscellaneous plastics products	28 Plastics and synthetic materials 32 Rubber and miscellaneous plastics products
25 Wholesale and retail trade	69 Wholesale and retail trade	69A Wholesale trade 69B Retail trade	69A Wholesale trade 69B Retail trade
26 Transportation and warehousing	65 Transportation and warehousing	65D Air transportation 65A Railroads and related services; passenger ground transportation 65C Water transportation 65B Motor freight transportation and warehousing 65E Pipelines, freight forwarders, and related services	65D Air transportation 65A Railroads and related services; passenger ground transportation 65C Water transportation 65B Motor freight transportation and warehousing 65E Pipelines, freight forwarders, and related services
27 Publishing industries (includes software)	26 Printing and publishing	26A Newspapers and periodicals 26B Other printing and publishing	26A Newspapers and periodicals 26B Other printing and publishing
28 Broadcasting and telecommunications	66 Communications, except radio and TV 67 Radio and television	66 Communications, except radio and TV 67 Radio and TV broadcasting	66 Communications, except radio and TV 67 Radio and TV broadcasting
29 Finance and insurance	70 Finance and insurance	70A Finance 70B Insurance	70A Finance 70B Insurance
30 Real estate and rental and leasing	71 Real estate and rental	71A Owner-occupied dwellings 71B Real estate and royalties	71A Owner-occupied dwellings 71B Real estate and royalties
31 Professional and business services	73 Business services	73A Computer and data processing services 73B Legal, engineering, accounting, and related services 73C Other business and professional services, except medical 73D Advertising	73A Computer and data processing services 73B Legal, engineering, accounting, and related services 73C Other business and professional services, except medical 73D Advertising
32 Educational services, health care, and social assistance	77 Health, educational, and social services and nonprofit	77A Educational and social services, and membership organizations 77B Health services	77A Educational and social services, and membership organizations 77B Health services
33 Arts, entertainment, and	76 Amusements	76 Amusements	76 Amusements
34 Accommodation	72 Hotels; personal and repair services (except auto)	72A Hotels and lodging places	72A Hotels and lodging places
35 Food services and drinking	74 Eating and drinking places	74 Eating and drinking places	74 Eating and drinking places
36 Other services, except government	75 Automobile repair and services	72B Personal and repair services (except auto) 75 Automotive repair and services	72B Personal and repair services (except auto) 75 Automotive repair and services
37 Federal	78 Federal Government enterprises	78 Federal Government enterprises	78 Federal Government enterprises
38 State and local	79 State and local government enterprises	79 State and local government enterprises	79 State and local government enterprises

付録 2 日本の産業連関表

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Web (<http://www.sanken.keio.ac.jp/user/kiji/>) I-O ¹²

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