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Development of Jidea 6

Current position of development

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Why ▫ New Model?

- A long time have passed since the current model (Jidea 5) was built and new data become available.
- K. Shiraishi will present an application of Jidea 5.
- Base year also changed from 1995 to 2000.

Development stages

1. Data ▫ preparations
2. Estimations (cohr, dep, ….) ←We are now here.
   Model: program coding, final test , simulation…

Annex: Problems of G program in building national economic model.

1-1. Data preparations

Differences in data between old and new model

1. Data coverage: Jidea 5 (1985-1998) vs Jidea 6 (1985-2004)
2. Sector numbers: 100 vs 66
3. No Across method in building A matrix
4. Capital Matrix: presented by Y. Sasai.
5. Capital Stock: presented by T. Hasegawa in terms of JIDEAL

1-1-1. Data coverage

- Original nominal and real data for the year 1985 to 1994
  457 intermediate input sectors →reclassified into 66 sectors

- FD: cohr, cogr, cobr, iprr(invr), ingr, venr, expr, impr adjr,
  coh, cog, cob, ipr(inv), ing, ven, exp, imp adj,

- VA: wag, pro, dep, tax, oth, sub, wi (wi=outr - totintr - va)

- Employment data, labour productivity, etc.

- Macro data (real term: 2000 price, nominal term) derived from SNA.

Japanese I-O data

	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04
base table	85b					90b					95b					00b				
extended table																				
85 price		86e	87e	88e	89e	90e	91e													
90 price								92e	93e	94e	95e									
95 price												96e	97e	98e	99e	00e	01e	02e		
00price																			03e	04e
linked table																				
95 price	8595					9095					95l									
00 price						9000					9500					00l				
created deflator	8595(9000/9095)				89e(9000/90e)				(93e/95e)9500				97e*9500				01e*9500			
00 price		86e(9000/90e)				9000				(94e/95e)9500				98e*9500			02e*9500	03e	04e	
			87e(9000/90e)				91e(9000/90e)				9500				99e*9500					
				88e(9000/90e)				(92e/95e)9500				96e*9500				00l				

sector number	511× 398					511× 399					511× 399				511× 399		71	71	186	186
	184					184					184				184				73	73
	92					99					99				99					
	32					32					32				32					
dummy variables																				
85dm		1	1	1	1		1													
90dm								1	1	1										
95dm												1	1	1	1		1	1		

The result is shown at ExcelDFL-ono.xls.

1-1-2. Sector numbers (100→66)

	jidea 6		jidea 5
1	Agriculture, forestry and fishery	1	Agriculture for crops
		2	Livestock raising and sericulture
		3	Agricultural services
		4	Forestry and logging
		5	Fishery
2	Metalic ores	6	Metal ores
3	Non-metalic ores and coal	7	Non-metal ores
4	Coal mining	8	Coal and lignite
5	Petro & gas exploration	9	Crude petroleum & gas
6	Food & tacacco products	10	Food products
7	Beverages	11	Beverages & tobacco
		12	Feeds and organic fertilizers
8	Textile products	13	Fabricated textile products
9	Clothing	14	Wearing and other textile products
10	Timber	15	Timber and wooden products
11	Furniture	16	Wooden & Metal Furniture, Fittings
12	Pulp & paper	17	Pulp and paper
13	Printing & publishinging	18	Publishing and printing
14	Inorganic basic chemicals	19	Chemical fertilizer
		20	Inorganic basic chemicals
15	Petrochemical basic products	21	Petrochemical basic products
16	Organic chemical products	22	Organic chemical products
17	Synthetic resin	23	Synthetic resin
18	Chemical fibers	24	Chemical fibers
19	Final chemicals	25	Medicaments
20	Medicine	26	Final chemical products
21	Petroleum refinery products	27	Petroleum refinery products
22	Coal products	28	Coal products
23	Plastic products	29	Plastic products
24	Rubber products	30	Rubber products
		31	Leather & Fur products

	jidea 6		jidea 5
25	Glass & glass products	32	Glass and glass products
26	Cement & cement products	33	Cement and cement products
27	Pottery, tiles & earthenware	34	Pottery, tiles and earthenware
28	Other ceramic, stone & clay products	35	Other ceramic, stone and clay products
29	Iron & steel	36	Pig iron and crude steel
		37	Steel bar and sheet
		38	Steel castings and forging
30	Non-ferrous metals refinery products	39	Non-ferrous metals refinery products
31	Processed non-ferrous metal products	40	Processed non-ferrous metal products
32	Metal products for construction	41	Metal products for construction
33	Other metal products	42	Heating equipment
		43	Other metal products
34	General Machineery	44	General Machineery
		45	Machine Tool & Robot
35	Special industry machinery	46	Special industry machinery
36	Other general machines & tools	47	Other general machines and tools
37	Machinery for office & for vending	48	Machinery for office and for vending
		49	Machinery for service
38	Household electric & electronic equipment	50	Household electric & electronic equipment
39	Electronic computer & accessories devices	51	Electronic computing equipment and accessories devices
40	Communication equipment	52	Communication equipment
41	Electronic appliances & measuring equipment	53	Electronic appliances & measuring equipment
42	Semi-conductor devices & integrated circuits	54	Semi-conductor devices and integrated circuits
43	Electronic Parts	55	Electronic Parts
44	Heavy electrical equipment	56	Heavy electrical equipment, Generators, Motors, etc.
45	Electric illuminator, batteries & others	57	Electric illuminator, batteries & other light electric app.
46	Motor vehicle	58	Motor vehicle
47	Other vehicle	59	Ships and repair of ships
48	Other transportation equipment	60	Railway equipment
		61	Air plane & repair
		62	Other transportation equipment
49	Precision & Medical instrument, etc.	63	Precision instruments, Medical instrument, etc.
50	Miscellaneous manufacturing products	64	Miscellaneous manufacturing products

jidea 6		jidea 5
51	Construction	65 Dwelling construction
		66 Other construction
52	Civil engineering public	67 Civil engineering public
53	Civil engineering private	68 Civil engineering private
54	Electric power	69 Electric power
55	Gas & hot water supply	70 Gas and hot water supply
56	Water supply & treatment	71 Water supply
		72 Waste treatment
57	Trade	73 Trade
58	Financial & insurance services	74 Financial and insurance services
		75 Real estate agencies and rent
		76 House rent
59	Transportation services	77 Railway transport
		78 Road transport
		79 Water transport
		80 Air transport
		81 Transportation related service & Storage
60	Communication & Broadcasting	82 Communication
		83 Broadcasting
61	Public administration	84 Public administration
62	Education, research & Medical service	85 Education
		86 Research Institute
		87 Medical service, health and social security
		88 Social security service
		89 Other public service
63	Information service	90 Advertising agencies
		91 News & Information service
		92 Renting and leasing
		93 Car & other machinery repair
64	Business Service	94 Business Service
		95 Amusement service, films, theater, sports
		96 Restaurant
		97 Hotel
65	Personal Service	98 Personal Service, Washing, Barber, etc.
66	Office Supply & N.E.C.	99 Office Supply
		100 Not elsewhere Classified

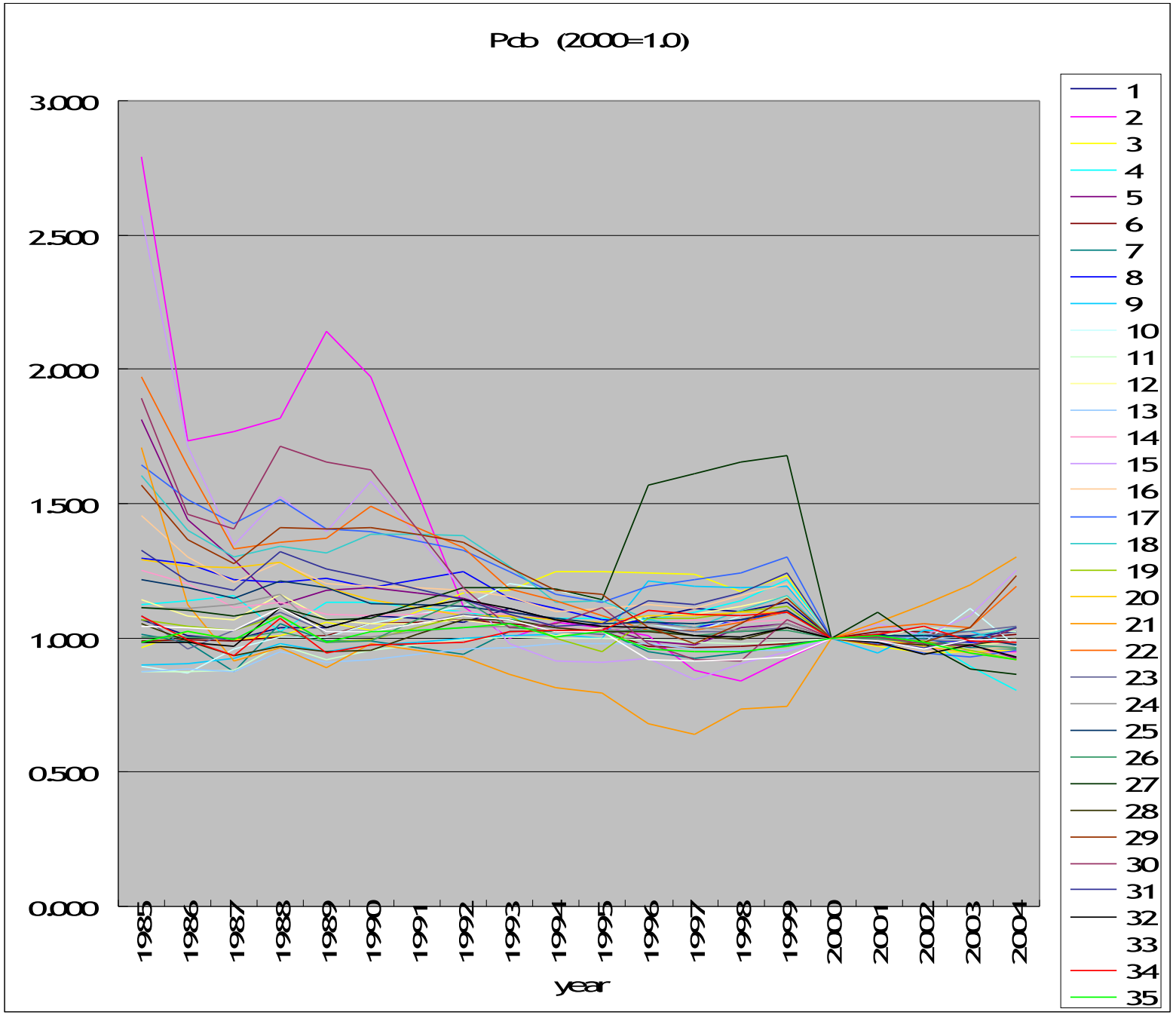
1-1-3. □ No Across method in building A matrix

- Across has two functions:

  1. Correcting the discrepancies of data occurred by the difference in base year.
  2. Correcting the discrepancies caused by the definition changes of sectors or data sources change.

- Alternative way:

  1. To minimize the 2nd factor by reclassifying the sectors.
  2. For the first factor, to introduce base-year dummy variables: 85dm, 90dm and 95dm.
  3. To avoid the distortion in deflator caused by applying Across method.


Pcb (2000=1.0)
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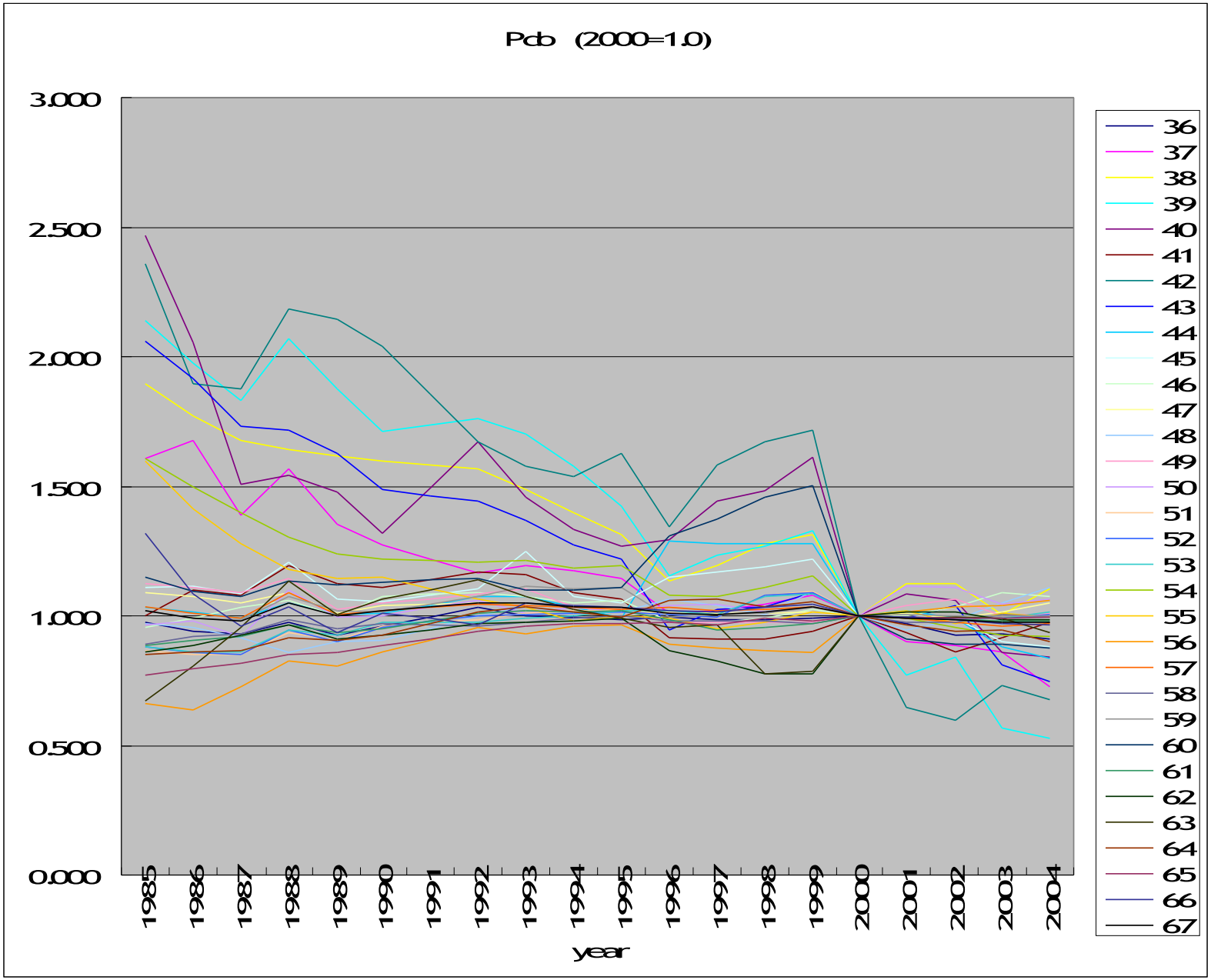
Pcb (2000=1.0)
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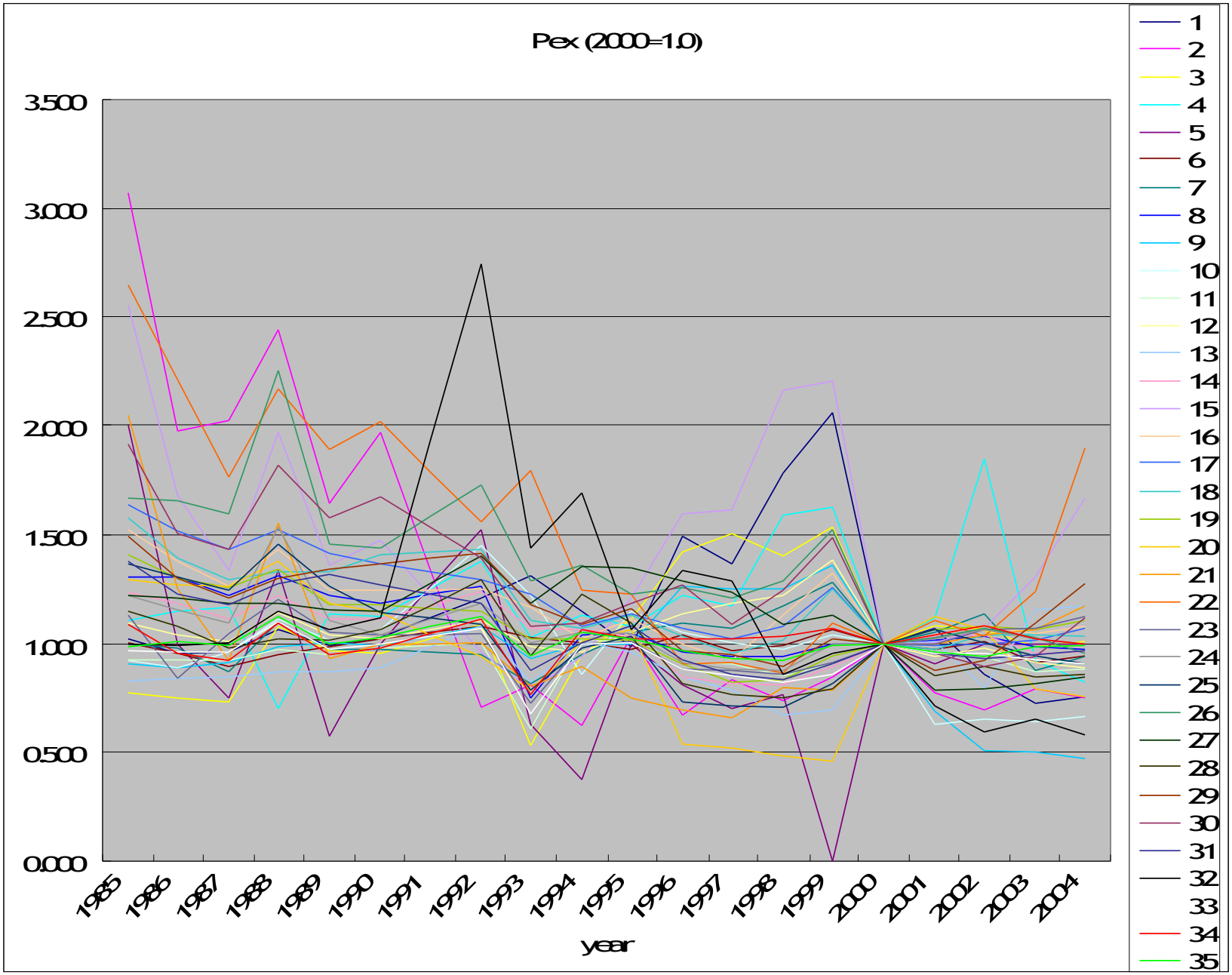
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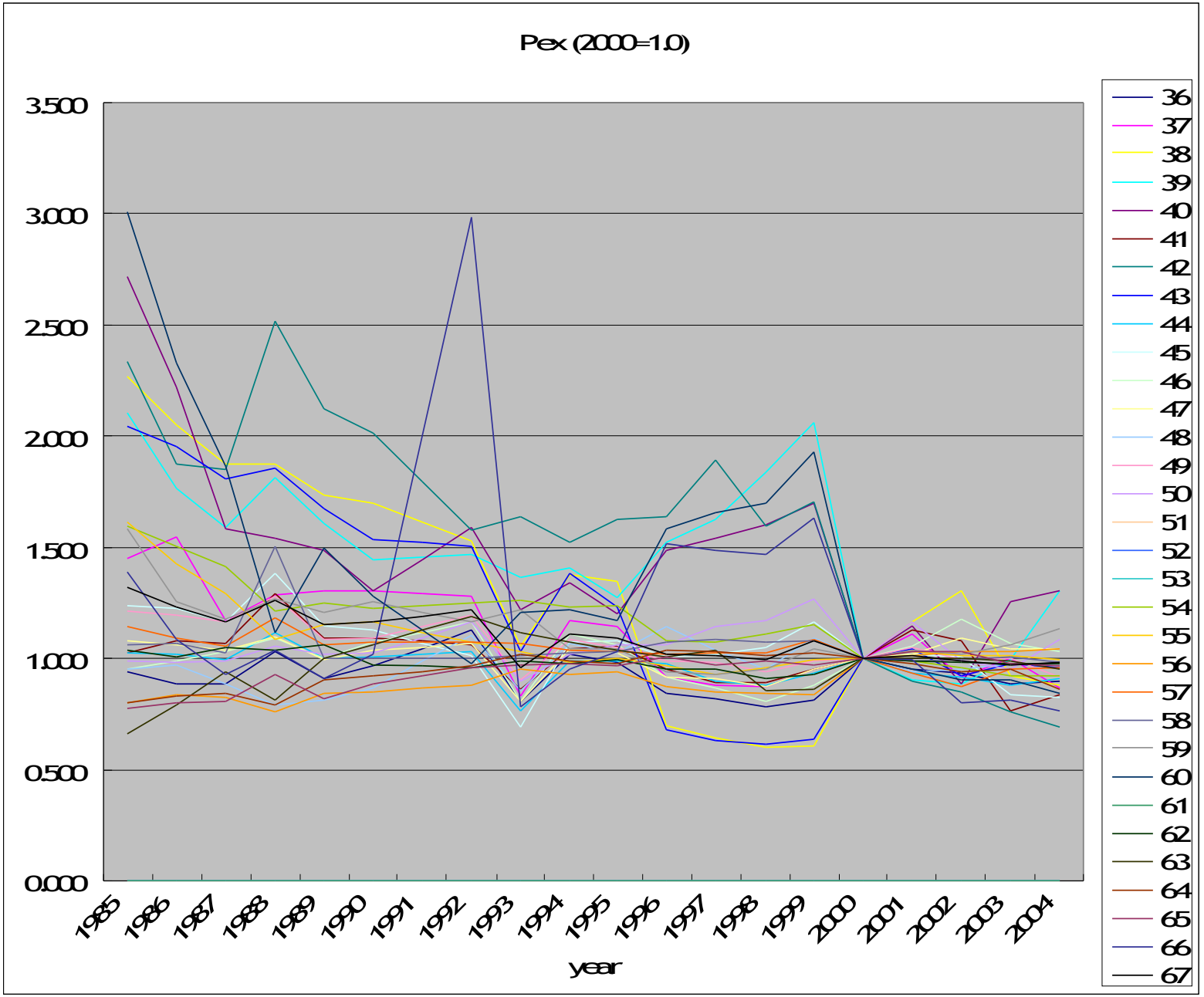
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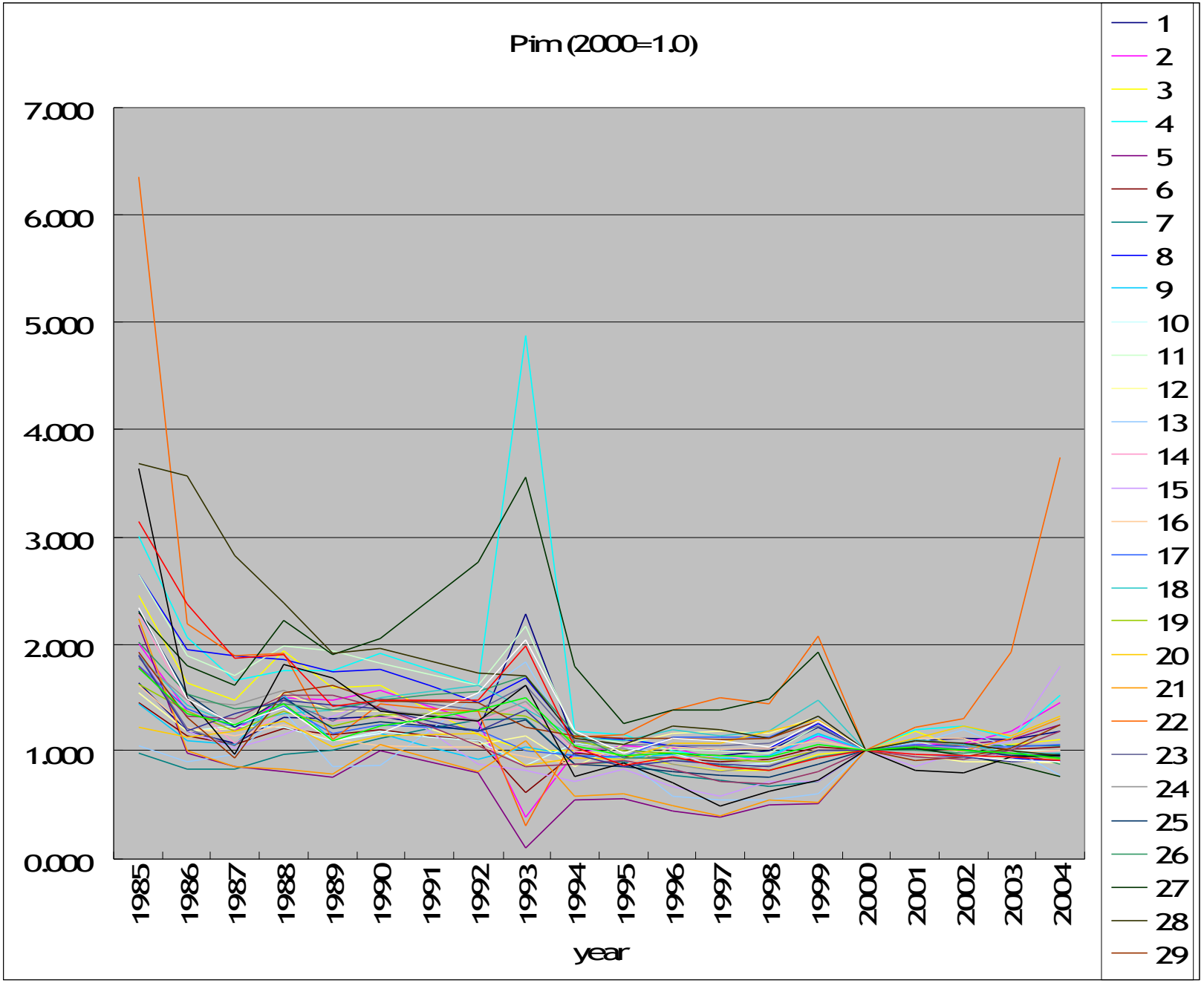
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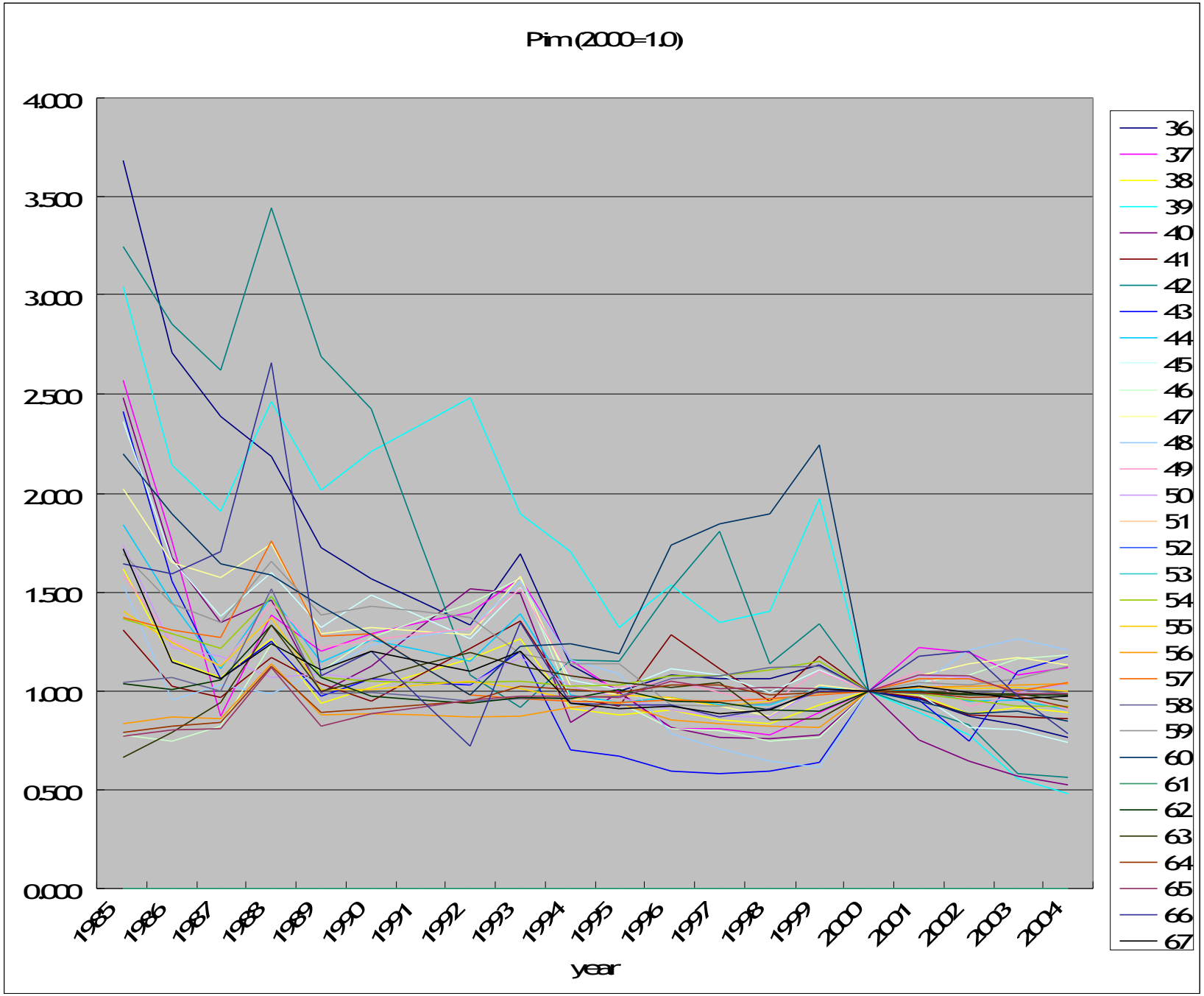
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1-1-4. Capital Matrix

- In Jidea 5, we only use capital matrix in the year of 1995.
- However, in Jidea 6, we extended to the year of 1985, 1990, 1995 and 2000.
- As a result, we expect to obtain better results of private investment functions.

Cf: The capital matrix is used to convert data from ipr(r) to inv(r), vice versa.

Detail will be explained by Y. Sasai.

2. ▫ Consumption function

- Basic formula

  Cohrpop(i) = f(dm85, dm90, dm95, pcdisincr, pdd(i)/cohdfl)

- ▫ In Jidea 5, ▫▫ Cohrpop(i) = f(dm85, dm90, dm95, timet)

▫ ▫ In Jidea 6, ▫ log(Cohrpop(i)) = f(dm85, dm90, dm95, timet)

▫ log(Cohrpop(i)) = f(dm85, dm90, dm95, timet, $timet_2$) ▫

▫ log(Cohrpop(i)) = f(dm85, dm90, dm95, timet, $timet_2$, $timet_3$)

▫ 1 ▫▫ y=a ▫ b^x ▫▫▫ 2 ▫ y=a ▫ b^x ▫ c^x^2 ▫▫▫ 3 ▫▫ y=a ▫ b^x ▫ c^x^2 ▫▫▫▫▫ 3 ▫

log(share(i)) = f(dm85, dm90, dm95, timet)

given to log(share)=log(cohr(i))-log(totcohr)

Result will be shown here: Jidea6\coh\cohreg.ini.

Function types

type		dm85	dm90	dm95	income	price	other
a	cohrpop	□	□	□	pcdisincr	relpri	
□	lcohrpop	log(type a)					
c	cohrpop	□	□	□	pcdisincr	relpri(-1)	
d	lcohrpop	log(type c)					
e	cohrpop	□	□	□	pcdisincr		
f	lcohrpop	log(type e)					
g	lcohrpop	□	□	□	lpcdisincr		lpdd
h	cohrpop	□	□	□	pcdisincr		cohrpop(-1) without constant term
i	cohrpop	□	□	□	pcdisincr		cohrpop(-1)
j	lshare	□	□	□			time time^2
k	lshare	□	□	□			time
l	lshare	□	□	□			time time^2 time^3
m	lcohr	□	□	□			time

Estimation results summary

sector no.		est. period	type	AR^2	D.W.
1	Agri,fishery	1985-2004	j	0.92	2.77
3	Non-met ores	1986-2004	e	0.83	1.67
4	Coal	1985-2004	j	0.92	2.94
6	Food prod	1985-2004	a	0.80	1.62
7	Beverages	1985-2004	a	0.90	2.29
8	Textiles	1985-2004	c	0.99	0.93
9	Clothing	1985-2004	j	0.98	1.25
10	Wood	1985-2004	a	0.74	1.96
11	Furniture	1985-2004	a	0.63	1.39
12	Pulp&paper	1985-2004	a	0.85	1.58
13	Printing	1985-2004	g	0.63	2.13
14	Inorg chem	1985-2004	b	0.96	1.35
16	Organic chem	1985-2004	j	0.22	1.80
19	Final chem	1985-2004	a	0.96	2.79
20	Medicine	1985-2004	m	0.47	1.94
21	Petro prod	1985-2004	a	0.88	1.86
22	Coal prod	1985-2004	j	0.78	2.42
23	Plastic prod	1985-2004	a	0.68	1.23
24	Rubber prod	1986-2004	i	0.82	*0.06
25	Glass	1985-2004	e	0.72	1.63
26	Cement	1985-2004	a	0.90	2.07
27	Pottery	1985-2004	k	0.64	1.11
28	Oth ceramic	1985-2004	l	0.73	2.52
29	Iron & steel	1985-2004	a	0.61	1.95
30	Nonfer meta	1985-2004	k	0.45	2.49
31	Proce Nonfer	1986-2004	h	0.98	*0.39
32	Metal const	1985-2004	m	0.31	2.24
33	Metal other	1985-2004	i	0.93	1.73

sector no.		est. period	type	AR^2	D.W.
34	Machine gene	1985-2004	a	0.93	2.80
35	Machine spec	1985-2004	e	0.82	1.73
36	Machine oth	1985-2004	c	0.92	2.87
37	Mach office	1985-2004	g	0.75	1.53
38	Mach hous el	1985-2004	a	0.96	1.60
39	Computer	1985-2004	b	0.95	1.34
40	Communic eqp	1985-2004	b	0.91	1.65
43	Electro part	1985-2004	e	0.82	2.06
45	Oth light el	1985-2004	a	0.83	1.42
46	Motor vehicl	1985-2004	a	0.64	1.25
47	Other vehicl	1985-2004	a	0.74	1.63
48	Other transp	1985-2004	a	0.76	1.95
49	Precision	1985-2004	a	0.69	1.98
50	Mfg miscella	1985-2004	j	0.71	1.19
54	Elec power	1985-2004	a	0.87	1.39
55	City gas	1985-2004	f	0.61	0.49
56	Water & sewa	1986-2004	h	0.65	*0.92
57	Trade	1985-2004	c	0.95	2.45
58	Finance	1985-2004	f	0.74	0.51
59	Transport	1985-2004	a	0.96	0.84
60	Communicat	1985-2004	a	0.87	1.14
61	Government S	1986-2004	d	0.74	1.04
62	Oth public S	1985-2004	a	0.82	1.30
63	Inform serv	1985-2004	m	0.87	2.20
64	Buisnes serv	1985-2004	a	0.83	1.28
65	Persnl Serv	1986-2004	d	0.87	1.24
66	Office suppl	1985-2004	j	0.69	2.09

*: h test

Regarding Depreciation function, T. Imagawa will make presentation later.

Annex: Problems of G program in building national economic model.

A-1. ▫ Rho ▫ adjustment

- For rho adjustment, the program is written to calculate
  $Y_{(n+s)}=a+b*X_{(n+s)}+e*rho^{\wedge s}$

  where n: year, s: term, e: error of last term of an observation data available, and parameter ▫ a and b are estimated by ols.

  This is acceptable if a and b are obtained by gls.

  But I have no idea if this is also understandable in case the parameters are obtained by ols.

A-2. Input figures

- When I try to register a figure 1.111111111110 in g/vam bank, the input figure recorded as 1.1111111641 in a bank.
- I think this is because default value of G7 is 7 digit below decimal point.
- I want to make the effectiveness of digits much more like 10 digit below decimal point.
- As the number of our model sectors is 100, when aggregated the sector's figures from 1 to 100, there happens a discrepancy in the fourth or fifth digit below decimal point. That corresponds to 100 million yen order and I want to avoid any error in this digit.

- The trouble became outstanding when we calculate @csum(cohr,1-100) .
- The result was 296.684906. When we added from cohr1 to cohr100 by excel, result was 296.684899.
- The difference was 7 million yen.

- When we applied this to output, @csum(outr,1-100)=1041211.5625 and excel result was 1041211.66187525. (unit: billion yen)
- The difference became 99 million yen.

A-3. Compare program

- When using compare program, some discrepancies occur.
  In compare program, ∑cohr ▫ =296.6854148778,
  however, in G, ▫ cum ▫ cohr,1-100 ▫ =296.685394287109.

  Why does this happen? How can we rectify the differences?

A-4. Data expression

When we want to know the recorded figures in detail, the following results are obtained by using type command under the current default.

```
ty totoutr

totoutr
    1985   689994.6   263436.7   280436.2   304391.8   320121.5
    1990   339536.3   351716.4   371481.7   341314.1   329431.5
    1995   329998.8   340711.5   353222.3   985385.6    1005107
    2000    1041213158025859335096171200000000 -0.0001000
-0.0001000 -0.0001000
    2005 -0.0001000 -0.0001000 -0.0001000 -0.0001000
-0.0001000
    2010 -0.0001000
```

Can we express the data much more precisely without overflow?

A-5 ▫ Soft Constraint

A-6. improvement of g: easy-to-handle

▫ better exchangeability with excel file.

▫▫ estimation by gls ▫ though H-L technique is available.

▫▫ automatic coding system ▫ replacing model.cpp coding.

▫▫ key board macro is desirable in G7 editor.