

Trade and Labor Productivity Effects on the Changing Structure of Employment in Japan

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1. Introduction

There has been a lot of discussion on the trade effects on employment. Most commonly accepted view was that the unfavorable labor market trends in OECD countries were deeply connected with the growth of NIE's exports to OECD countries. The memory is still fresh that the Japanese manufacturing exports to the USA and to Europe in 60s, 70s, 80s, and even in 90s were blamed by the same reason. Now the situation is quite different. OECD's comprehensive work on this theme has brought to an end of this debate. Universally accepted conclusion of this subject is "the impact of changing trade patterns on labor market condition is significant, but generally small relative to other factors, especially technological progress."¹ This paper is re-challenging to this subject, especially to examine to what extent other factors than trade is dominant in changing structure of employment in Japan. Before going to the main part of this paper, it is helpful to present a brief sketch of employment structure in Japan, which appears in the next section. In the third section some earlier studies related to this problem are introduced. Fourth section, main part of this paper, describes the method and result of analysis based on JIDEA7, newly developed Japanese version of INFORUM type model.² The final section provides concluding remarks and remaining problems. References and tables are attached at the end of the volume.

¹ OECD(1994), p.108.

² Description of JIDEA7 is available in Sasai (2008).

2. Brief sketch of changing structure of employment

Table-1 presents a brief sketch of changing structure of employment in Japan. Relative share to total employment in 1985, 1990, 1995, 2000 and 2006, and growth rate from 1985 to 2006 of 66 industrial sectors were rearranged by descending order of growth rate. In these 20 years relative share of sectoral employment to total employment changed remarkably. 1. Agriculture, forestry & fishery marked an considerable share of over 10% relative to total employment in 1985. It was only 4.4% in 2006 and growth rate was -2.79%. 57. Trade, 62. Other public services, and 65. Personal services are keeping 17.7%, 15.5% and 13.1% share to total employment respectively, though the growth rate of 57. Trade is only 0.3%. Ten sectors of biggest job gains in the same period were 63. Information services, 22. Coal products, 62. Other public services, 19. Final chemicals, 20. Medicine, 64. Business services, 55. City gas, 54. Electric power & gas, 65. Personal services, and 56. Water & sewerage, while ten sectors of biggest job losses during these 20 years were. 4. Coal, 5. Petro & gas, 8. Textiles, 37. Machine office, 2. Metallic ores, 29. Iron & steel, 1. Agriculture, forestry & fishery, 21. Petro products, 15. Petro chemicals, and 9. Clothing. Other outstanding features are found in 58. Finance, 52. Civil engineering, 51. Construction, 61. Government services, and 59. Transportation services. These service sectors, excluding Finance with negative growth rate, are growing and expanding their relative share to total employment. Though with negative growth rate, 6. Food products is still keeping over 2% of share relative to total employment during the observation period. In short, Japanese economy is now in the stage of post industrialization, where manufacturing sectors are declining while service sectors are rapidly expanding.

3. Some earlier studies on this subject

One of the analyses based on INFORUM type model on the employment structure is Almon & Grassini (2000). Though the factor affecting on employment is not trade but investment, it is interesting to know that the investment effect on employment is not almighty, and that “employment share of Office machinery and Chemicals were not increased.”³

Krugman (1995), starting to present overview of trends in world trade, demonstrates, in the framework of theoretical two-country and two-commodity model, the numerical example of the employment effect of trade under the inflexible relative wages (European case) and flexible wages (American case). He concludes “the growth of low-wage manufactured exports almost certainly has had some role in the growth

³ Almon & Grassini(2000), p.1.

both of unemployment in Europe and wage inequality in the USA, though the NIEs trade is not the principal cause of these labor market problems.”⁴

Messerlin (1995), based on I-O accounting methods, estimates the net impact of trade on French jobs, and summarizes as follows. “Ten sectors with highest net job gains are agriculture, car, aircraft, services to firms, electric machines, tyres, maritime transport, specialty chemicals, foundry, railway equipment, and ten sectors with highest net job losses are plastics, construction, crude oil, scientific equipment, natural gas, shoes, fishing, coal, hosiery, office machines.”⁵ He concludes “trade has had, at most, a modest impact on total employment which depends more upon macroeconomic factors and policies as well as upon the structure of labor and product markets,”⁶ suggesting the domestic factors are dominant.

OECD (1994), after scrutinizing how the trade of OECD countries has developed between the early 1960s and the early 1990s and showing an expansion of trade with non-OECD countries, especially with the expansion of trade in manufactured goods with S. E. Asian countries, summarizes that “the impact of trade between OECD and non-OECD on employment is clear. There are significant negative correlations between relative import penetration and relative employment changes (changes in employment by sector relative to manufacturing employment over all) for small number of specific industries (textiles, clothing, footwear, computers, radio-TV communication), but the impact is quantitatively small (because the level of trade is low).⁷ OECD’s conclusion is “the impact of changing trade patterns on labor market conditions is significant, but generally small relative to other factors, especially technological progress.”⁸

What interests us most in Sachs & Shatz (1994) is the comparative static technique based on I-O table for determining Decomposition of Employment Changes resulting from Trade.⁹ First, defining the ratio of net imports to final demand in 1978, then, multiplying this ratio to final demand in 1990, 1990 net imports presumed as same ratio as 1978 level can be calculated. Then, differential between presumed and actual level of 1990 net imports or change in net import, with the help of inverse of the input–output table, can calculate output effect.¹⁰ Their finding is “the rise in net imports after 1978 has resulted in a significant loss of employment: 7.2% of production

⁴ Krugman(1995), p.361.

⁵ Messerlin(1995), Table 5, p.99.

⁶ Messerlin, *ibid*, p.115.

⁷ OECD *ibid*, p.104.

⁸ OECD *ibid*, p.108.

⁹ Sachs & Shatz(1994), pp.26-32.

¹⁰ Sachs & Shatz *ibid*, p.27.

workers and 2.1% of non production workers (measured relative to 1978 employment level),”¹¹ Their conclusion is “increased internationalization cannot, by itself, account for most of the observed labor market trends, and that technological change is playing a role independent of internationalization, though precise measurement of the relative importance of these two factors are not available.”¹²

Baldwin (1994) presents comprehensive summary and assessment of recent studies (as of 1994) on the trade and foreign investment effects on employment and wages in OECD countries. His conclusion is, referring to OECD study¹³, “the domestic factors, such as changes in demand for domestic goods and increases in labor productivity have generally been much more important in accounting for changes in total domestic employment than changes in demand for imports. He also points out that “in the countries and periods covered in this study, the employment-creating effects of increased exports usually dominated the employment–displacing effects of increased imports, and that “increased imports were a major factor in accounting for employment declines in particular low-technology industries, such as textiles, clothing, footwear, ferrous metals, wood and furniture, and food, drink and tobacco.”¹⁴

4. Trade and labor productivity effects on employment

To examine the trade and labor productivity effects on employment, four different types of historical or retrospective simulations based on JIDEA7 were performed according to the respective set of *vecfix.vfx*.¹⁵ They are named as RS1, RS4, RS6 and RS8. Though data period for estimating regression equations of JIDEA7 is 1985-2006, the starting year of the simulation is 2000 and the terminal year is 2006 to cover the economic behavior of 7 years of recent past.

RS1 stands for the historical simulation for the baseline. To prepare the baseline of which macro variables could trace the actual path of macro data such as *gdpr* and inflation rate, *vecfix.vfxes* were applied on *cohr :all* (total household consumption expenditure in real term), *expr :all* (total export in real term), *invr :all* (total private investment in real term) and *wag :all* (total wages in nominal term). Then baseline figures of sectoral employment were computed and the figures in 2006 were picked up in excel sheet.

Before going to the alternative cases of simulation, definition of some key

¹¹ Sachs & Shatz *ibid*, p.28.

¹² Sachs & Shatz, *ibid*, p.4.

¹³ OECD(1992), p.8.

¹⁴ Baldwin(1994), p.44.

¹⁵ LastData, Dyme.cfg should also be rewritten for historical simulation.

variables should be given. Definition of *prdh* is inverse of labor productivity or labor coefficient multiplied by hours worked, or $prdh = prd * hw$, here, $prd = emp / outr$, *hw* stands for sectoral hours worked, *emp* is sectoral employment, and *outr* implies sectoral output in real terms. Here, *prdh* is a variable representing technological progress of labor-saving type meaning the smaller the *prdh*, the greater the technological progress, though the relation between *prdh* and technological progress is not clearly defined.¹⁶ As is well-known, technological progress can be interpreted by changes in input coefficients of I-O table, however, the experiment to manipulate the input coefficient is not yet attempted in this analysis.¹⁷ *Share* is defined as sectoral import divided by sectoral total domestic demand ($ddtotr = outr + impr - expr - adjr$). Here, *impr* stands for import in real term, *expr* is export in real term, and *adjr* implies adjustment for Consumer Tax on export in real term.

RS4 is the simulation in which sectoral *prdh* is fixed by means of *vecfix.vfx* to the level decreased by 5% from 2006 level in RS1. Figures of sectoral employment declined by the effect of *prdh* decreased by 5% were estimated.

RS6 is the simulation in which sectoral import share is fixed to the level decreased by 5% from the level of 2006 in RS1. Figures of sectoral employment increased by the effect of import share decreased by 5% were calculated.

RS8 stands for the simulation in which sectoral export value, increased by the same percent change of import in real terms calculated in RS6, is fixed in 2006. Figures of the sectoral employment increased by the effect of export increased by the same percent change of import in RS6 were computed.

Prdh and trade effects on sectoral employment were calculated in the form of percentage change following;

RS4: $(RS4 - RS1) / RS1 * 100.0$ represented as *Prdh* in Table-2

RS6: $(RS6 - RS1) / RS1 * 100.0$ represented as *Share* in Table-2

RS8: $(RS8 - RS1) / RS1 * 100.0$ represented as *Net Export* in Table-2

Table-2 shows the results of simulation on the employment effect of labor productivity (RS4), of import (RS6) and of export (RS8) in the form of percentage changes from baseline (RS1). These percentage figures correspond to the 5% changes in the instrument variables such as *Prdh*, *Share*, and *Export*, their absolute values are comparable to each other.

Discussion of the result are following; in the left-hand side of the table, effects of *prdh* and trade on sectoral employment are presented by ascending order of

¹⁶ More elaborate explanation on this relation is available in Hasegawa (2008).

¹⁷ For a good example of this analysis, see Ono (2008).

the figure of Prdh. Comparison of the absolute values of the figures (%) shows Prdh are dominant in the effect on sectoral employment in almost all the industries as shown by shadowed figures in the table. This result coincides with what Baldwin (1994) mentioned in his conclusion¹⁸. There are few exceptions, which are more clearly shown in the center of table 2.

In the center of the table, effects of prdh and trade on sectoral employment are presented by descending order of the figure of Share. Comparison of the absolute values of the figures(%) suggest that import effect is stronger than prdh and export in sectors of 9.Clothing, 30.Non-ferrous metal products, 18.Chemical fiber, 8.Textiles, 10. Woods, 50.Miscellaneous manufacturing, and 51.Construction. These findings have some similarities with what was described in Baldwin (1994)¹⁹ and OECD (1994).²⁰

In the right-hand side of the table, effects of trade and net export on sectoral employment are displayed by descending order of the figure of Net Export. Net export means export minus import and is more useful to compare import and export effects on sectoral employment. By the net export effect on sectoral employment 66 industrial sectors can be classified into three groups. Import has stronger effect on the change in 28 sectoral employment, while export effect is dominant in the change in other 28 sectoral employment. This result shows that the Japanese case is slightly different from the result of earlier study.²¹ In 6 industries export and import have the same percentage effect on employment as can be seen in the table. They are sectors of 60.Communication, 55.City gas, 52.Civil engineering. 26.Cement, 21.Petro products, 15.Petro chemicals. Net export effect shows more clearly net job gains and losses by selected sectors. Ten sectors with highest net job gains are, 47.Other vehicles, 45.Electric illuminator, batteries & others, 48.Other transportation equipment 46.Motor vehicle, 36.Other general machines & tools, 35.Machine special, 41.Electronic appliances & measuring equipment, 44.Heavy electric machinery, 29.Iron & steel, and 38.Household electric & electronic equipment. Ten sectors with highest net job losses are 6.Food products, 3.Non-metallic ores, 11.Furnitre, 50.Miscellaneous manufacturing, 1.Agriculture, forestry, and fishery, 10.Wood, 8.Textiles, 18.Chemical fiber, 30.Non-ferrous metal products, and 9.Clothing.

Comparison of table-1 with table-2 suggests that the declined employment in sectors 1.Agriculture, forestry, & fishery, 8.Textiles and 9.Clothing in table-1 may

¹⁸ Baldwin, *ibid*, p.43.

¹⁹ Baldwin, *ibid*, p.44.

²⁰ OECD(1994), p.104.

²¹ Baldwin, *ibid*, p.43. He concludes the employment-creating effects of increased exports usually dominate the employment-displacing effects of increased imports.

be caused by net export effect, since these three sectors are categorized in ten sectors with highest net job losses in table-2, though there are a lot of counter-examples to the suggestion above. For example, 29.Iron & steel is grouped in highest net job gaining sectors in table-2, while in table-1 it is categorized in the group of ten sectors with lowest growth rate.

5. Concluding Remarks

From the analysis above, the main findings are as follows;

- (1) Prdh effect is stronger than trade effects for almost all industries except for 9.Clothing, 30.Non-ferrous metal products, 18.Chemical fiber, 8.Textiles, 10.Wood, 50.Miscellaneous manufacturing and 51.Construction.
- (2) If we compare import and export effect on sectoral employment, Japanese pattern is a little bit different from other OECD countries where the export effect is dominant. Out of 62 industries, excluding 4 sectors of 66.Office supply, 5.Petro & gas, 4.Coal and 2.Metallic ores, import has stronger effect on the changes in 28 sectoral employments, while export has dominant effect on the changes in other 28 sectoral employments. In 6 industries export and import have the same effect since the percentage figure is same.
- (3) Net export effect shows more clearly net job gains and losses by selected sectors. Ten sectors with highest net job gains are, 47.Other vehicles, 45.Electric illuminator, batteries & others, 48.Other transportation equipment, 46.Motor vehicle, 36.Other general machines & tools, 35.Machine special, 41.Electronic appliances & measuring equipment, 44.Heavy electric machinery, 29.Iron & steel, and 38.Household electric & electronic equipment. Ten sectors with highest net job losses are 6.Food products, 3.Non-metallic ores, 11.Furniture, 50.Miscellaneous manufacturing, 1.Agriculture, forestry, and fishery, 10.Wood, 8.Textiles, 18.Chemical fiber, 30.Non-ferrous metal products, and 9.Clothing.
- (4) Comparison of table-1 with table -2 suggests that the declining employment of three sectors, namely, 1.Agriculture, forestry, & fishery, 8.Textiles and 9.Clothing may be caused by net export effect, though counter-examples are easily found.

Remaining problems are as follows;

- (1) The causes to produce the change in labor coefficient (prdh) such as R & D, capital stock or technological progress should be investigated.
- (2) Input coefficients representing technological progress could also be included as one of the instrument variables in this study.
- (3) Relative wage by sector, to which changes in sectoral employment is related, should

also be included in the analysis.

- (4) Intra and/or inter-industry labor flow should not be ignored, though there are some doubts about data availability.
- (5) Importance of foreign direct investment flows on employment should be considered, though the data availability is not promising.

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Table-1		Changing Structure of Employment of Japan					(Descending order of growth rate)	
emp	2006	Relative share to total employment (%)					growth rate(N)	
		1985	1990	1995	2000	2006	06/85	
63	Inform ser	0.60	0.93	1.00	1.48	2.36	16.16	
22	Coal prod	0.01	0.01	0.01	0.03	0.02	5.79	
62	Oth public	8.42	9.64	11.10	11.64	15.50	4.92	
19	Final chem	0.21	0.23	0.22	0.24	0.36	4.30	
20	Medicine	0.22	0.25	0.23	0.25	0.38	4.21	
64	Buisnes se	4.20	4.79	5.05	7.71	6.43	3.25	
55	City gas	0.06	0.07	0.07	0.07	0.08	2.70	
54	Elec power	0.22	0.23	0.24	0.26	0.30	2.49	
65	Persnl Ser	10.39	10.62	11.33	11.23	13.11	1.81	
56	Water & se	0.51	0.52	0.54	0.59	0.63	1.73	
59	Transport	4.42	4.39	4.61	4.67	4.92	1.00	
31	Proce Nonf	0.29	0.29	0.28	0.22	0.32	0.86	
61	Government	3.47	3.21	3.20	2.95	3.67	0.70	
23	Plastic pr	0.76	0.85	0.92	0.70	0.78	0.50	
24	Rubber pro	0.33	0.34	0.31	0.20	0.33	0.36	
51	Constructi	5.11	5.93	5.53	5.60	5.06	0.34	
52	Civil eng	2.52	2.38	3.15	2.75	2.48	0.31	
30	Nonfer met	0.03	0.03	0.03	0.02	0.03	0.30	
57	Trade	18.00	17.17	16.64	20.58	17.69	0.30	
33	Metal othe	1.13	1.19	1.11	0.83	1.07	0.11	
40	Communic e	0.18	0.18	0.17	0.14	0.17	0.00	
45	Oth light	0.62	0.62	0.57	0.49	0.57	-0.01	
43	Electro pa	0.76	0.76	0.70	0.61	0.70	-0.01	
42	IC	0.73	0.73	0.67	0.58	0.68	-0.01	
41	El apld&me	0.13	0.14	0.12	0.11	0.12	-0.01	
32	Metal cons	0.61	0.64	0.60	0.44	0.55	-0.11	
6	Food prod	2.35	2.28	2.51	1.88	2.08	-0.21	
39	Computer	0.27	0.27	0.25	0.22	0.24	-0.28	
38	Mach hous	0.20	0.20	0.18	0.16	0.17	-0.37	
53	Civil eng	1.36	1.33	1.87	1.29	1.16	-0.39	
50	Mfg miscel	0.79	0.76	0.71	0.65	0.67	-0.42	
58	Finance	4.39	4.79	4.68	3.70	3.67	-0.49	
7	Beverages	0.23	0.20	0.21	0.27	0.19	-0.50	
49	Precision	0.55	0.52	0.42	0.33	0.44	-0.66	
12	Pulp&paper	0.55	0.58	0.58	0.43	0.44	-0.67	
36	Machine ot	1.18	1.23	1.14	0.85	0.92	-0.81	
34	Machine ge	0.18	0.19	0.17	0.13	0.13	-1.03	
3	Non-met or	0.04	0.13	0.10	0.06	0.03	-1.06	
48	Other tran	0.48	0.37	0.34	0.31	0.35	-1.07	
26	Cement	0.37	0.35	0.35	0.25	0.27	-1.12	
13	Printing	1.12	1.16	1.21	0.98	0.80	-1.15	
35	Machine sp	0.87	0.91	0.84	0.63	0.60	-1.30	
47	Other vehi	1.38	1.41	1.37	0.83	0.95	-1.30	
46	Motor vehi	0.48	0.49	0.48	0.29	0.33	-1.31	
25	Glass	0.24	0.22	0.20	0.13	0.16	-1.39	
27	Pottery	0.19	0.18	0.17	0.10	0.13	-1.49	
11	Furniture	0.52	0.53	0.49	0.33	0.31	-1.74	
28	Oth cerami	0.19	0.18	0.17	0.10	0.11	-2.03	
16	Organic ch	0.08	0.06	0.07	0.03	0.05	-2.04	
17	Syn resin	0.11	0.09	0.10	0.04	0.06	-2.05	
10	Wood	0.61	0.55	0.48	0.30	0.33	-2.06	
14	Inorg chem	0.06	0.05	0.05	0.02	0.03	-2.06	
18	Chem fiber	0.03	0.03	0.03	0.01	0.02	-2.10	
60	Communicat	1.10	1.08	1.02	1.13	0.56	-2.25	
44	Heavy elec	0.75	0.84	0.75	0.33	0.38	-2.26	
9	Clothing	2.31	2.32	1.89	0.87	1.14	-2.34	
15	Petro chem	0.06	0.05	0.06	0.02	0.03	-2.37	
21	Petro prod	0.07	0.06	0.06	0.03	0.03	-2.66	
1	Agri, fishe	10.81	8.76	7.31	8.17	4.43	-2.79	
29	Iron & ste	0.77	0.65	0.57	0.48	0.24	-3.30	
2	Metalic or	0.00	0.01	0.00	0.00	0.00	-3.33	
37	Mach offic	0.36	0.38	0.33	0.10	0.10	-3.45	
8	Textiles	0.82	0.63	0.44	0.13	0.11	-4.28	
5	Petro & ga	0.03	0.01	0.01	0.00	0.00	-4.71	
4	Coal	0.13	0.01	0.01	0.00	0.00	-4.92	
66	Office sup	0.00	0.00	0.00	0.00	0.00	0.00	
	Total	100.00	100.00	100.00	100.00	100.00	0.39	

Table-2 Trade and productivity effects on employment: Results of simulation by JIDEA7														
Ascending order of Prdh					Descending order of import share					Descending order of net export				
Emp	2006	Prdh %	Share %	Export %	Emp	2006	Prdh %	Share %	Export %	Emp	2006	Share %	Export %	Net Export %
1	Agri, fishe	-5.62	2.14	0.18	9	Clothing	-4.04	9.92	0.62	47	Other veh	0.71	2.83	2.12
4	Coal	-5.41	0.00	0.00	30	Nonfer me	-4.14	5.52	2.07	45	Oth light	1.18	2.86	1.68
55	City gas	-5.09	0.51	0.51	18	Chem fiber	-3.33	5.00	1.67	48	Other tran	1.55	3.01	1.46
52	Civil eng	-4.96	0.04	0.04	8	Textiles	-3.32	4.43	1.11	46	Motor veh	0.28	1.68	1.40
61	Govemme	-4.95	0.64	0.69	10	Wood	-2.64	3.88	1.41	36	Machine o	1.19	2.39	1.19
7	Beverages	-4.78	0.27	0.11	50	Mfg miscel	-2.62	3.21	1.35	35	Machine s	1.42	2.58	1.16
6	Food prod	-4.76	1.14	0.09	39	Computer	-3.99	3.10	2.44	41	El apld&me	1.43	2.46	1.04
38	Mach hous	-4.65	1.49	2.33	42	IC	-4.45	3.04	2.87	44	Heavy ele	1.59	2.52	0.93
65	Persnl Ser	-4.52	0.60	0.26	16	Organic ch	-4.44	2.96	2.22	29	Iron & ste	1.56	2.45	0.89
56	Water & se	-4.51	0.54	0.52	14	Inorg chem	-3.70	2.78	1.85	38	Mach hous	1.49	2.33	0.84
42	IC	-4.45	3.04	2.87	49	Precision	-3.84	2.40	1.94	34	Machine g	1.41	2.23	0.82
17	Syn resin	-4.44	1.67	2.22	11	Furniture	-3.27	2.39	1.33	25	Glass	1.61	2.42	0.81
16	Organic ch	-4.44	2.96	2.22	43	Electro pa	-4.17	2.26	2.39	37	Mach offic	1.48	2.22	0.74
19	Final chem	-4.44	1.45	1.54	1	Agri, fishe	-5.62	2.14	0.18	24	Rubber prt	1.40	2.06	0.66
44	Heavy ele	-4.38	1.59	2.52	3	Non-met c	-3.52	2.11	1.06	17	Syn resin	1.67	2.22	0.56
24	Rubber prt	-4.26	1.40	2.06	15	Petro cher	-4.21	2.11	2.11	31	Proce Nor	1.93	2.42	0.50
15	Petro cher	-4.21	2.11	2.11	51	Constructi	-1.85	1.93	1.88	33	Metal othe	1.40	1.64	0.24
60	Communic	-4.21	0.74	0.74	31	Proce Nor	-3.92	1.93	2.42	27	Pottery	1.72	1.94	0.22
35	Machine s	-4.20	1.42	2.58	40	Communic	-3.92	1.87	1.19	23	Plastic pr	1.85	2.05	0.20
36	Machine o	-4.18	1.19	2.39	23	Plastic pr	-3.85	1.85	2.05	57	Trade	0.78	0.95	0.17
43	Electro pa	-4.17	2.26	2.39	12	Pulp&pape	-3.73	1.73	1.23	28	Oth ceram	1.57	1.73	0.16
41	El apld&me	-4.15	1.43	2.46	27	Pottery	-3.66	1.72	1.94	59	Transport	1.29	1.43	0.14
45	Oth light	-4.15	1.18	2.86	22	Coal prod	-3.70	1.68	1.35	43	Electro pa	2.26	2.39	0.13
30	Nonfer me	-4.14	5.52	2.07	17	Syn resin	-4.44	1.67	2.22	19	Final chem	1.45	1.54	0.09
46	Motor veh	-4.09	0.28	1.68	25	Glass	-4.03	1.61	2.42	54	Elec powe	1.47	1.53	0.06
9	Clothing	-4.04	9.92	0.62	44	Heavy ele	-4.38	1.59	2.52	61	Govemme	0.64	0.69	0.06
25	Glass	-4.03	1.61	2.42	32	Metal cons	-2.60	1.57	1.54	62	Oth public	1.48	1.52	0.04
13	Printing	-4.02	1.00	0.91	28	Oth ceram	-3.92	1.57	1.73	53	Civil eng	1.31	1.34	0.03
39	Computer	-3.99	3.10	2.44	29	Iron & ste	-3.72	1.56	2.45	66	Office sup	0.00	0.00	0.00
34	Machine g	-3.99	1.41	2.23	48	Other tran	-3.18	1.55	3.01	60	Communic	0.74	0.74	0.00
28	Oth ceram	-3.92	1.57	1.73	20	Medicine	-3.89	1.53	1.33	55	City gas	0.51	0.51	0.00
40	Communic	-3.92	1.87	1.19	38	Mach hous	-4.65	1.49	2.33	52	Civil eng	0.04	0.04	0.00
31	Proce Nor	-3.92	1.93	2.42	37	Mach offic	-2.96	1.48	2.22	26	Cement	1.10	1.10	0.00
20	Medicine	-3.89	1.53	1.33	62	Oth public	-3.48	1.48	1.52	21	Petro prod	0.92	0.92	0.00
47	Other veh	-3.88	0.71	2.83	54	Elec powe	-3.70	1.47	1.53	15	Petro cher	2.11	2.11	0.00
23	Plastic pr	-3.85	1.85	2.05	19	Final chem	-4.44	1.45	1.54	5	Petro & ga	0.00	0.00	0.00
49	Precision	-3.84	2.40	1.94	41	El apld&me	-4.15	1.43	2.46	4	Coal	0.00	0.00	0.00
12	Pulp&pape	-3.73	1.73	1.23	35	Machine s	-4.20	1.42	2.58	2	Metalic or	0.00	0.00	0.00
29	Iron & ste	-3.72	1.56	2.45	34	Machine g	-3.99	1.41	2.23	56	Water & se	0.54	0.52	-0.02
63	Inform ser	-3.72	1.04	1.01	33	Metal othe	-3.63	1.40	1.64	63	Inform ser	1.04	1.01	-0.03
14	Inorg chem	-3.70	2.78	1.85	24	Rubber prt	-4.26	1.40	2.06	32	Metal cons	1.57	1.54	-0.03
22	Coal prod	-3.70	1.68	1.35	53	Civil eng	-3.42	1.31	1.34	51	Constructi	1.93	1.88	-0.05
54	Elec powe	-3.70	1.47	1.53	64	Buisnes se	-3.41	1.31	1.20	58	Finance	0.67	0.61	-0.06
21	Petro prod	-3.67	0.92	0.92	59	Transport	-2.92	1.29	1.43	13	Printing	1.00	0.91	-0.10
27	Pottery	-3.66	1.72	1.94	36	Machine o	-4.18	1.19	2.39	64	Buisnes se	1.31	1.20	-0.10
33	Metal othe	-3.63	1.40	1.64	45	Oth light	-4.15	1.18	2.86	7	Beverages	0.27	0.11	-0.16
3	Non-met c	-3.52	2.11	1.06	6	Food prod	-4.76	1.14	0.09	42	IC	3.04	2.87	-0.17
62	Oth public	-3.48	1.48	1.52	26	Cement	-3.31	1.10	1.10	20	Medicine	1.53	1.33	-0.20
57	Trade	-3.44	0.78	0.95	63	Inform ser	-3.72	1.04	1.01	22	Coal prod	1.68	1.35	-0.34
53	Civil eng	-3.42	1.31	1.34	13	Printing	-4.02	1.00	0.91	65	Persnl Ser	0.60	0.26	-0.35
64	Buisnes se	-3.41	1.31	1.20	21	Petro prod	-3.67	0.92	0.92	49	Precision	2.40	1.94	-0.45
18	Chem fiber	-3.33	5.00	1.67	57	Trade	-3.44	0.78	0.95	12	Pulp&pape	1.73	1.23	-0.50
8	Textiles	-3.32	4.43	1.11	60	Communic	-4.21	0.74	0.74	39	Computer	3.10	2.44	-0.67
26	Cement	-3.31	1.10	1.10	47	Other veh	-3.88	0.71	2.83	40	Communic	1.87	1.19	-0.68
11	Furniture	-3.27	2.39	1.33	58	Finance	-2.95	0.67	0.61	16	Organic ch	2.96	2.22	-0.74
48	Other tran	-3.18	1.55	3.01	61	Govemme	-4.95	0.64	0.69	14	Inorg chem	2.78	1.85	-0.93
37	Mach offic	-2.96	1.48	2.22	65	Persnl Ser	-4.52	0.60	0.26	6	Food prod	1.14	0.09	-1.05
58	Finance	-2.95	0.67	0.61	56	Water & se	-4.51	0.54	0.52	3	Non-met c	2.11	1.06	-1.06
59	Transport	-2.92	1.29	1.43	55	City gas	-5.09	0.51	0.51	11	Furniture	2.39	1.33	-1.06
10	Wood	-2.64	3.88	1.41	46	Motor veh	-4.09	0.28	1.68	50	Mfg miscel	3.21	1.35	-1.87
50	Mfg miscel	-2.62	3.21	1.35	7	Beverages	-4.78	0.27	0.11	1	Agri, fishe	2.14	0.18	-1.96
32	Metal cons	-2.60	1.57	1.54	52	Civil eng	-4.96	0.04	0.04	10	Wood	3.88	1.41	-2.47
51	Constructi	-1.85	1.93	1.88	66	Office sup	0.00	0.00	0.00	8	Textiles	4.43	1.11	-3.32
2	Metalic or	0.00	0.00	0.00	5	Petro & ga	0.00	0.00	0.00	18	Chem fiber	5.00	1.67	-3.33
5	Petro & ga	0.00	0.00	0.00	4	Coal	-5.41	0.00	0.00	30	Nonfer me	5.52	2.07	-3.45
66	Office sup	0.00	0.00	0.00	2	Metalic or	0.00	0.00	0.00	9	Clothing	9.92	0.62	-9.30
Total		-3.78	1.24	1.03	Total		-3.78	1.24	1.03	Total		1.24	1.03	-0.21