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Investment Behavior and Industrial Competitiveness

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1 Introduction

The purchasing side in industry is crucial in examining the industrial competitiveness. In those arguments in competitiveness, the capital stock data by industrial sector might be one of the important factors. At the same time, capital stock data by itself is closely utilized in estimating the total factor productivity in the framework of the growth accounting. This article examines the relation between the international competitiveness and the industrial advantage in production.

The international competitiveness of the j-th industry is measured by the growth rate of export in real term;

$$\exp rgr_j = \frac{\Delta \exp r_j}{\exp r_j}.$$

This international competitiveness, $exprgr_j$ is affected by the price difference and the productivity of productive factors. In INFORUM Bilateral Trade Model, the external trade is regressed by the relative price and the capital stocks as the explanative variables.[1] On the other hand, the national economic growth is explained in the use of the productivity of productive factors. There might be a possibility that the external trade by industry is not only explained by the relative prices and the capital stock, but also by the technology progress. Such technology progress is well described by the total factor productivity, TFP in a framework of Growth Accounting. If the capital stock data is available, tracing this total factor productivity becomes manageable.

In the formula of growth accounting, the total factor productivity, TFP is expressed by the following equation;

$$TFP = \frac{\Delta A}{A} = \frac{\Delta Y}{Y} - \left(\alpha \frac{\Delta K}{K} + (1 - \alpha) \frac{\Delta L}{L} \right)$$

The total factor productivity, TFP, which is denoted by $\frac{\Delta A}{A}$, is measured as the residual of the contributions by the productive factors in the economic growth, $\frac{\Delta Y}{Y} = \frac{\Delta outr_j}{outr_j}$, where $outr_j$ denotes the output in the real term by the j-th industry, j=1,2,…,66. The income distributions of the productive factors, capital and labor are expressed by the symbols, α and $(1 - \alpha)$; where α and $(1 - \alpha)$, are measured in the nominal terms as the value-added in the database of JIDEA model for Japanese economy as follows;

[1] *Nyhus D. E. (1991), "The INFORUM International System", Economic Systems Research, Vol. 3, Issue 1. Also, Ma Q. (1996), "A Multisectoral Bilateral World Trade Model", Ph.D. Thesis, University of Maqryland.*

$$\alpha_j = \frac{pro_j}{va_j}\text{, and}$$

$$\left(1 - \alpha_j\right) = \frac{wag_j}{va_j}.$$

va_j, value-added by industry, where sector j=1,2,…,66,

pro_j, operating surplus by industry, where sector j=1,2,…,66, and

wag_j, wage and salary paid by industry, where sector j=1,2,…,66.

In addition, the change of labor input by industry = $\frac{\Delta L}{L} = \frac{\Delta emp_j}{emp_j}$ *, where sector j=1,2,…,66, and the change of capital stock by industry=* $\frac{\Delta K}{K} = \frac{\Delta kstkrps_j}{kstkrps_j}$ *, where sector j=1,2,…,66.*

The data of capital stock for JIDEA model was created in terms of "Cascaded Leaky Buckets" approach[2]. The original capital stock kstkrp by 65 purchasing sectors created in JIDEA version 6 was converted to kstkrps, 66 purchasing sectors in order to compare with the other variables. In our analysis, JIDEA6 data well functioned in providing the comprehensive table of Total Factor Productivity in Growth Accounting by industry, as shown in the last page of this article. Data of the TFP change, the economic growth, the capital and the labor contributions in economic growth were calculated in three kinds of time span, 1985-1995, 1995-2005, and 1985-2005.

2 Export and Total Factor Productivity

Many standard textbooks in economics write that the total factor productivity, TFP reflects the economic competitiveness.[3] We would like to examine the relation between the change of exports and the change of total factor productivity.

The following estimation of total export change was regressed by three explanatory variables, the change of total factor productivity, the change of capital stocks, and the total foreign demand for Japan made goods. The change of total export,totexprgr, was regressed by the change of tatal factor productivity, and the change of capital stock, and total foreign demand for Japanese made products; tfp, kstkgr and totfdm respectively.

All data was available from the current version JIDEA6 database for the time span from 1985 to 2005 by sector and also in macro level. Following table and figure are the estimation result in the aggregate level. It

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[2] *Clopper Almon (1989) originally developed this "Cascaded Leaky Buckets" approach in* ***The Craft of Economic Modelling****, second edition, Ginn Press. The procedure how we created the capital stock data for Japanese economy was explained in the following articles: Toshiaki Hasegawa (2007), "Time series data of Japanese capital stock by sector; "cascated leaky buckets" in INFORUM approach", and Yasuhiko Sasai (2007), "On the capital Mtrices of JIDEA 6" in* ***Recent Developments in INFORUM-type Modeling****, Lodz University Press, Lodz, Poland. Also, in T. Hasegawa (forthcoming), "Fiscal Policy, Private Investment Behaviors and Economic Growth in Japan - In a context of Interindustry analysis based approach" in* ***MACROMODELS'2006****, Lodz University Press, Poland, applied this data to analyze in macro economic context.*

[3] *Gregory Mankiw (2003),* ***Macroeconomics****, fifth edition, Worth Publishers.*

seems that three explanatory variables could well behave in the change of Japanese export.

: Total Export Function in terms of TFP

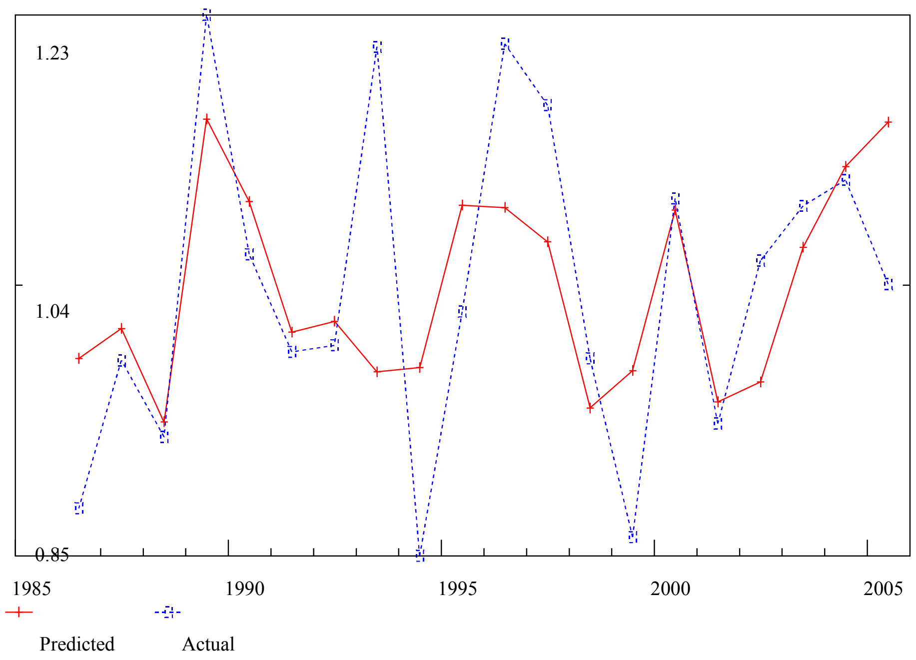
SEE = 0.08 RSQ = 0.8820 RHO = -0.10 Obser = 21 from 1985

SEE+1 = 0.08 RBSQ = 0.8611 DW = 2.20 DoFree = 17 to 2005

MAPE = 6.24

Variable name	Reg-Coef	Mexval	Elas	NorRes	Mean	Beta	t-value	F-Stat
0 totexprgr	- - - - - - - - - - - - - - - - -				0.99 - - - - - - - - - - -			
1 intercept	0.75406	78.6	0.76	8.47	1.00		6.099	
2 tfp	1.69043	23.6	0.03	7.73	0.02	0.270	2.993	42.う 34
3 kstkgr	1037764.98489	177.2	-0.05	1.27	-0.00	0.900	10.658	57.17
4 totfdm	0.00496	12.6	0.25	1.00	50.65	0.194	2.134	4.55

Total Export Function in terms of TFP



Japanese export by industry could be also explained by the change of tatal factor productivity, and the change of capital stock, and total foreign demand for Japanese made products; tfp, kstkgr and totfdm respectively. The regression results of some representative industries, such like the industries of Organic Chemical, Machine Specific, Semiconductor Device and Other Vehicle, were described as follows;

: 16 Organic chemical

SEE = 0.20 RSQ = 0.4412 RHO = 0.56 Obser = 21 from 1985.000

SEE+1 = 0.20 RBSQ = 0.3426 DW = 0.87 DoFree = 17 to 2005.000

MAPE = 2926090.43

Variable name	Reg-Coef	Mexval	Elas	NorRes	Mean	Beta	t-value	F-Stat

0 exprgr16	**- - - - - - - - - - - - - - - - -**				**1.02**	**- - - - - - - - - - -**		
1 intercept	**0.36652**	**7.8**	**0.36**	**1.79**	**1.00**		**1.655**	
2 tfp	**0.93130**	**11.4**	**0.03**	**1.54**	**0.03**	**0.368**	**2.023**	**4.47**
3 kstkgr16	**9.99583**	**21.5**	**0.20**	**1.39**	**0.02**	**0.661**	**2.846**	**4.58**
4 fdm16	**0.45749**	**17.9**	**0.41**	**1.00**	**0.92**	**0.598**	**2.575**	**6.63**

: 35 Machine specific

SEE = 0.20 RSQ = 0.4242 RHO = 0.54 Obser = 21 from 1985.000

SEE+1 = 0.21 RBSQ = 0.3226 DW = 0.91 DoFree = 17 to 2005.000

MAPE = 3475004.30

Variable name	Reg-Coef	Mexval	Elas	NorRes	Mean	Beta	t-value	F-Stat
0 exprgr35	**- - - - - - - - - - - - - - - - -**				**1.00**	**- - - - - - - - - - -**		
1 intercept	**0.25183**	**1.7**	**0.25**	**1.74**	**1.00**		**0.762**	
2 tfp	**0.80558**	**9.6**	**0.02**	**1.29**	**0.03**	**0.362**	**1.854**	**4.17**
3 kstkgr35	**5.66348**	**9.7**	**0.11**	**1.27**	**0.02**	**0.449**	**1.860**	**2.47**
4 fdm35	**0.65812**	**12.6**	**0.62**	**1.00**	**0.94**	**0.525**	**2.132**	**4.55**

: 42 Semiconductor device

SEE = 0.23 RSQ = 0.6188 RHO = 0.23 Obser = 21 from 1985.000

SEE+1 = 0.23 RBSQ = 0.5515 DW = 1.54 DoFree = 17 to 2005.000

MAPE = 3046961.33

Variable name	Reg-Coef	Mexval	Elas	NorRes	Mean	Beta	t-value	F-Stat
0 exprgr42	**- - - - - - - - - - - - - - - - -**				**1.13**	**- - - - - - - - - - -**		
1 intercept	**0.52067**	**20.6**	**0.46**	**2.62**	**1.00**		**2.777**	
2 tfp	**1.03255**	**48.4**	**0.10**	**1.47**	**0.11**	**0.679**	**4.520**	**9.20**
3 kstkgr42	**8.54487**	**15.5**	**0.11**	**1.40**	**0.01**	**0.431**	**2.385**	**4.04**
4 fdm42	**0.49480**	**18.4**	**0.33**	**1.00**	**0.75**	**0.471**	**2.611**	**6.82**

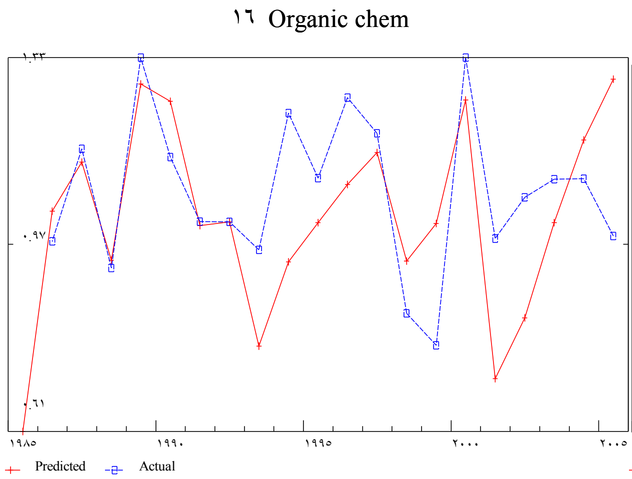
: 47 Other vehicle

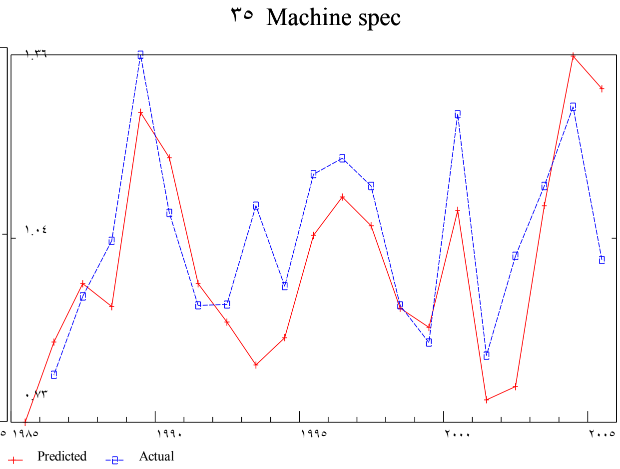
SEE = 0.21 RSQ = 0.5317 RHO = 0.07 Obser = 21 from 1985.000

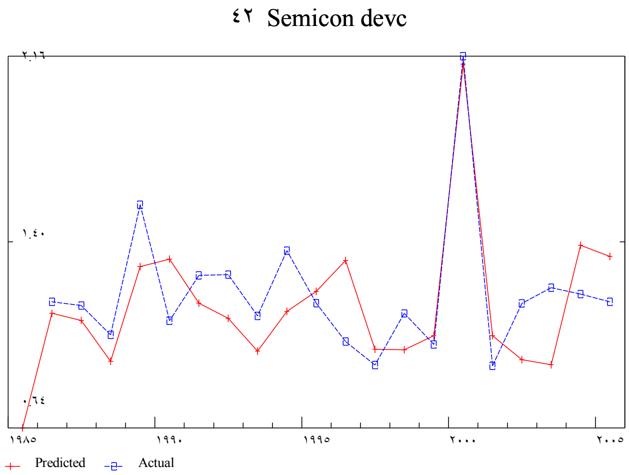
SEE+1 = 0.21 RBSQ = 0.4491 DW = 1.85 DoFree = 17 to 2005.000

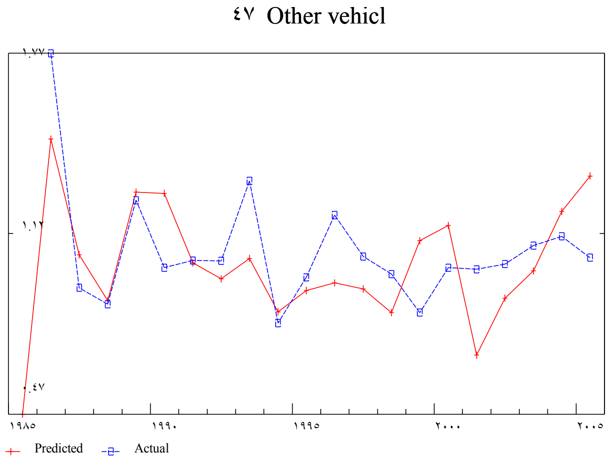
MAPE = 2259838.48

Variable name	Reg-Coef	Mexval	Elas	NorRes	Mean	Beta	t-value	F-Stat
0 exprgr47	**- - - - - - - - - - - - - - - - -**				**1.01**	**- - - - - - - - - - -**		
1 intercept	**-0.16105**	**0.7**	**-0.16**	**2.14**	**1.00**		**-0.489**	
2 tfp	**1.64815**	**19.1**	**0.07**	**1.71**	**0.04**	**0.475**	**2.669**	**6.43**
3 kstkgr47	**7.77321**	**20.2**	**0.16**	**1.63**	**0.02**	**0.566**	**2.748**	**6.06**
4 fdm47	**0.92848**	**27.5**	**0.92**	**1.00**	**1.01**	**0.670**	**3.261**	**10.63**









3. Concluding remarks

In this analysis in the framework of JIDEA6 model, we confirmed that the change of export in Japan is related to the total productivity in the aggregated level, and also by industry sector. Even though we were successful in these estimations, it might be better to consider the following problems.

1. *Theoretical causality between competitiveness and total factor productivity might be reexamined.*

2. *The adjustment of capital cost data to be alternated.; i.e., the depreciation of capital stock is included or not to be includes.*

3. *Consequently, it is necessary to examine what the income distribution of capital is;* $\alpha_j = \frac{pro_j}{va_j}$, $\alpha_j = \frac{pro_j + dep_j}{va_j}$, $\alpha_j = \frac{pro_j}{wag_j + pro_j}$, *or* $\alpha_j = \frac{pro_j + dep_j}{wag_j + pro_j + dep_j}$.

Therefore, the income distribution of labor might be also reexamined regarding with Euiler's theorem.

4. The wearout rate of capital stock might be reexamined in estimation.

5. Additional explanatory variables in estimating for the non tradable sectors to be necessary; i.e., current available data from BTM data is only for the tradable sectors.

6. In this analysis, we tried to introduce the relative prices into the regressions. The relative prices as the explanatory variables should be examined why the variables would not behave well, and how we can introduce these successfully.

Total Factor Productivity in Growth Accounting by Industry

	Output Growth Δ outr/outr			Capital contribution α*(Δ kstkrp/kstkrp)			Labor contribution (١-α)*(Δ emp/emp)			Total Factor Productivity Δ TFP/TFP		
	٨٥-٩٥	٩٥-٢٠٠٥	٨٥-٢٠٠٥	٨٥-٩٥	٩٥-٢٠٠٥	٨٥-٢٠٠٥	٨٥-٩٥	٩٥-٢٠٠٥	٨٥-٢٠٠٥	٨٥-٩٥	٩٥-٢٠٠٥	٨٥-٢٠٠٥
١ Agri,fishe	-٠.٠٠٧	-٠.٠١٠	-٠.٠٢٠	٠.٠٠٢	-٠.٠٠٥	-٠.٠٠٢	-٠.٠٠٤	-٠.٠٠٦	-٠.٠٠٤	-٠.٠٠٥	٠.٠٠٠	-٠.٠١٤
٢ Metalic or	-٠.٠٤٥	-٠.٠٢١	-٠.١٣٣	٠.٠٠٢	٠.٠٠٠	٠.٠٠٢	٠.٠٦٧	-٠.٠٤٣	-٠.٠١٥	-٠.١١٤	٠.٠٢٢	-٠.١١٩
٣ Non-met or	-٠.٠٢١	-٠.٠١٩	-٠.٠٥٥	٠.٠٠٧	-٠.٠٠١	٠.٠٠٤	٠.٠٦٦	-٠.٠٢٢	٠.٠٠١	-٠.٠٩٤	٠.٠٠٤	-٠.٠٥٩
٤ Coal	-٠.٠٦٧	-٠.٠٨٣	-١.٦٩٤	-٠.٠٠١	٠.٠٠٠	٠.٠٠١	-٠.٠٨١	-٠.٠٥٦	-٠.٠٣٩	٠.٠١٥	-٠.٠٢٧	-١.٦٥٦
٥ Petro & ga	٠.٠٠٦	٠.٠٣٦	٠.٠٣٠	٠.٠١٣	٠.٠٠٠	٠.٠٠٣	-٠.٠٢٨	-٠.٠١٤	-٠.٠١٢	٠.٠٢٠	٠.٠٥٠	٠.٠٣٩
٦ Food prod	٠.٠٠٣	-٠.٠٠٧	-٠.٠٠٤	٠.٠١١	٠.٠٠١	٠.٠٠٧	٠.٠٠٧	-٠.٠٠٧	٠.٠٠٠	-٠.٠١٤	-٠.٠٠١	-٠.٠١١
٧ Beverages	٠.٠٢٧	٠.٠٠٨	٠.٠٢٨	٠.٠٠٦	٠.٠٠١	٠.٠٠٩	٠.٠٠٠	-٠.٠٠١	-٠.٠٠١	٠.٠٢١	٠.٠٠٨	٠.٠١٩
٨ Textiles	-٠.٠٢١	-٠.٠٤٧	-٠.١٣٨	٠.٠٠٤	٠.٠٠٠	٠.٠٠١	-٠.٠٢٨	-٠.٠٥٢	-٠.٠٢٧	٠.٠٠٣	٠.٠٠٦	-٠.١١٢
٩ Clothing	-٠.٠١١	-٠.٠٦٨	-٠.٢٥٢	٠.٠٠٥	٠.٠٠٠	٠.٠٠٢	-٠.٠٠٧	-٠.٠٣٦	-٠.٠١٨	-٠.٠٠٨	-٠.٠٤٢	-٠.٢٣٦
١٠ Wood	-٠.٠٠٣	-٠.٠٣٤	-٠.٠٥٧	٠.٠٠٥	-٠.٠٠١	٠.٠٠٣	-٠.٠٠٩	-٠.٠٢٤	-٠.٠١٤	٠.٠٠١	-٠.٠٠٩	-٠.٠٤٦
١١ Furniture	٠.٠٠٦	-٠.٠٤٤	-٠.٠٦٨	٠.٠١٠	-٠.٠٠١	٠.٠٠٢	٠.٠٠٢	-٠.٠٢٠	-٠.٠١٠	-٠.٠٠٥	-٠.٠٢٣	-٠.٠٦٠
١٢ Pulp&paper	٠.٠٢٤	-٠.٠٠٧	٠.٠١٣	٠.٠٠٦	٠.٠٠١	٠.٠٠٥	٠.٠٠٩	-٠.٠١١	-٠.٠٠٣	٠.٠٠٩	٠.٠٠٣	٠.٠١١
١٣ Printing	٠.٠٣٢	٠.٠٠٠	٠.٠٢٥	٠.٠٠٦	٠.٠٠١	٠.٠٠٤	٠.٠١٢	-٠.٠١٨	-٠.٠٠٥	٠.٠١٥	٠.٠١٧	٠.٠٣٦
١٤ Inorg chem	٠.٠٠٩	-٠.٠٠٣	٠.٠٠٦	٠.٠١٠	٠.٠٠٥	٠.٠٠٨	-٠.٠٠١	-٠.٠١٢	-٠.٠٠٧	٠.٠٠٠	٠.٠٠٥	٠.٠٠٤
١٥ Petro chem	٠.١١١	٠.٠١٨	٠.٠٦٠	٠.٠١٨	٠.٠٠٤	٠.٠٠٧	٠.٠٠٠	-٠.٠٠٨	-٠.٠٠٣	٠.٠٩٣	٠.٠٢١	٠.٠٥٥
١٦ Organic ch	٠.٠٤١	٠.٠١٦	٠.٠٣٩	٠.٠١٢	٠.٠٠٣	٠.٠٠٥	-٠.٠٠١	-٠.٠١٢	-٠.٠٠٦	٠.٠٣١	٠.٠٢٥	٠.٠٤٠
١٧ Syn resin	٠.٠٥٩	٠.٠٠٣	٠.٠٣٩	٠.٠١٠	٠.٠٠٣	٠.٠٠٦	-٠.٠٠١	-٠.٠١٣	-٠.٠٠٧	٠.٠٥٠	٠.٠١٣	٠.٠٤١
١٨ Chem fiber	٠.٠٠٢	-٠.٠٢٣	-٠.٠٢٨	٠.٠٠٣	٠.٠٠٠	٠.٠٠١	-٠.٠٠١	-٠.٠٢٠	-٠.٠٠٩	٠.٠٠٠	-٠.٠٠٤	-٠.٠٢٠
١٩ Final chem	٠.٠٣٦	-٠.٠٠٥	٠.٠٢٢	٠.٠١٤	٠.٠٠٤	٠.٠٠٧	٠.٠٠٥	٠.٠٢٧	٠.٠١٨	٠.٠١٧	-٠.٠٣٦	-٠.٠٠٣
٢٠ Medicine	٠.٠٨٧	٠.٠١٢	٠.٠٥٢	٠.٠١٦	٠.٠٠٣	٠.٠٠٨	٠.٠٠٥	٠.٠٢٢	٠.٠١٢	٠.٠٦٦	-٠.٠١٣	٠.٠٢٢
٢١ Petro prod	٠.٠٤٤	٠.٠٠٠	٠.٠٣٠	٠.٠٠٣	٠.٠٠٠	٠.٠٠٠	٠.٠٠٠	-٠.٠٠٣	-٠.٠٠١	٠.٠٤١	٠.٠٠٢	٠.٠٣١
٢٢ Coal prod	٠.٠٠٣	-٠.٠٠٣	٠.٠٠٠	٠.٠١٣	٠.٠٠١	٠.٠٠٤	-٠.٠٠٩	٠.١٠٤	٠.٠٢١	-٠.٠٠١	-٠.١٠٨	-٠.٠٢٦
٢٣ Plastic pr	٠.٠٣٩	-٠.٠٠٨	٠.٠٢١	٠.٠٠٨	٠.٠٠٠	٠.٠٠٢	٠.٠١٤	-٠.٠١٢	٠.٠٠١	٠.٠١٦	٠.٠٠٤	٠.٠١٨
٢٤ Rubber pro	٠.٠١٨	-٠.٠٠٧	٠.٠٠٩	٠.٠٠٥	٠.٠٠٠	٠.٠٠٣	٠.٠٠٢	-٠.٠٠٦	-٠.٠٠٢	٠.٠١١	-٠.٠٠٢	٠.٠٠٨
٢٥ Glass	٠.٠٢٥	-٠.٠٠٢	٠.٠١٨	٠.٠١٣	٠.٠٠١	٠.٠٠٦	-٠.٠٠٢	-٠.٠١٤	-٠.٠٠٧	٠.٠١٤	٠.٠١٠	٠.٠٢٠
٢٦ Cement	٠.٠١٩	-٠.٠٣٦	-٠.٠٣٣	٠.٠٠٩	٠.٠٠١	٠.٠٠٤	٠.٠٠١	-٠.٠١٣	-٠.٠٠٦	٠.٠٠٩	-٠.٠٢٤	-٠.٠٢٩
٢٧ Pottery	٠.٠١٤	-٠.٠٣٩	-٠.٠٤٤	٠.٠٠٨	٠.٠٠٠	٠.٠٠٢	-٠.٠٠٤	-٠.٠١٨	-٠.٠١٠	٠.٠١٠	-٠.٠٢١	-٠.٠٣٦
٢٨ Oth cerami	٠.٠٠٦	-٠.٠١٤	-٠.٠١٠	٠.٠٠٩	٠.٠٠٠	٠.٠٠٣	-٠.٠٠٣	-٠.٠١٦	-٠.٠٠٩	٠.٠٠٠	٠.٠٠٢	-٠.٠٠٤
٢٩ Iron & ste	-٠.٠٠١	٠.٠٠٥	٠.٠٠٤	٠.٠١٤	٠.٠٠١	٠.٠٠٦	-٠.٠٠٧	-٠.٠٢٣	-٠.٠١٠	-٠.٠٠٧	٠.٠٣٦	٠.٠٠٨
٣٠ Nonfer met	٠.٠٣٣	٠.٠٣٦	٠.٠٤٠	٠.٠٠٣	٠.٠٠١	٠.٠٠٢	٠.٠٠٢	-٠.٠٠٢	٠.٠٠٠	٠.٠٢٨	٠.٠٣٧	٠.٠٣٨
٣١ Proce Nonf	٠.٠٤١	-٠.٠٠٤	٠.٠٣٦	٠.٠٠٩	٠.٠٠١	٠.٠٠٤	٠.٠٠٣	-٠.٠٠٢	٠.٠٠٠	٠.٠٣٠	-٠.٠٠٣	٠.٠٢٢
٣٢ Metal cons	٠.٠٤٣	-٠.٠٣٣	-٠.٠٠٤	٠.٠٠٥	٠.٠٠٠	٠.٠٠٣	٠.٠٠٤	٠.٠٠٠	٠.٠٠٢	٠.٠٣٤	-٠.٠٣٣	-٠.٠٠٩
٣٣ Metal othe	٠.٠٢٩	-٠.٠٢٠	٠.٠٠٣	٠.٠٠٦	٠.٠٠٠	٠.٠٠٢	٠.٠٠٤	٠.٠٠٠	٠.٠٠٣	٠.٠١٩	-٠.٠٢١	-٠.٠٠٢
٣٤ Machine ge	٠.٠٥٤	-٠.٠٠٣	٠.٠٣٣	٠.٠٠٩	٠.٠٠١	٠.٠٠٣	٠.٠٠٣	-٠.٠١٣	-٠.٠٠٦	٠.٠٤٢	٠.٠٠٩	٠.٠٣٦
٣٥ Machine sp	٠.٠٠٨	٠.٠١٩	٠.٠٢٣	٠.٠١٠	٠.٠٠١	٠.٠٠٥	٠.٠٠٣	-٠.٠١٢	-٠.٠٠٥	-٠.٠٠٤	٠.٠٣٠	٠.٠٢٣
٣٦ Machine ot	٠.٠٠٥	٠.٠٠٢	٠.٠٠٧	٠.٠٠٧	٠.٠٠١	٠.٠٠٢	٠.٠٠٣	-٠.٠١٤	-٠.٠٠٦	-٠.٠٠٥	٠.٠١٦	٠.٠١٠
٣٧ Mach offic	٠.٠٩١	-٠.٠٠٨	٠.٠٤٣	٠.٠٢١	٠.٠٠١	٠.٠٠٤	٠.٠٠٠	-٠.٠٣٣	-٠.٠١٧	٠.٠٧٠	٠.٠٢٤	٠.٠٥٥
٣٨ Mach hous	٠.٠١٦	-٠.٠٠٣	٠.٠١١	٠.٠١٢	٠.٠٠٢	٠.٠٠٦	٠.٠٠٠	٠.٠٠٠	٠.٠٠٠	٠.٠٠٤	-٠.٠٠٥	٠.٠٠٥
٣٩ Computer	٠.١٥٢	٠.٠٦٥	٠.٠٧٦	٠.٠١٠	٠.٠٠٢	٠.٠٠٢	٠.٠٠٠	٠.٠٠٠	٠.٠٠٠	٠.١٤٢	٠.٠٦٣	٠.٠٧٤
٤٠ Communic e	٠.٢٤٣	٠.٠٦٠	٠.٠٨٢	٠.٠٠٩	٠.٠٠٢	٠.٠٠٥	٠.٠٠٠	٠.٠٠٠	٠.٠٠٠	٠.٢٣٤	٠.٠٥٨	٠.٠٧٧
٤١ El apld&me	٠.٠١٩	٠.٠٤٤	٠.٠٤٢	٠.٠١٣	٠.٠٠٢	٠.٠٠٣	٠.٠٠٠	٠.٠٠٠	٠.٠٠٠	٠.٠٠٦	٠.٠٤٣	٠.٠٣٩
٤٢ IC	٠.٢٠٣	٠.١٢٨	٠.٠٨٦	٠.٠٠٧	٠.٠٠١	٠.٠٠٢	٠.٠٠٠	٠.٠٠٠	٠.٠٠٠	٠.١٩٦	٠.١٢٨	٠.٠٨٤
٤٣ Electro pa	٠.١٢٣	٠.٠٥٢	٠.٠٧١	٠.٠١١	٠.٠٠٢	٠.٠٠٤	٠.٠٠٠	٠.٠٠٠	٠.٠٠٠	٠.١١٢	٠.٠٥١	٠.٠٦٦
٤٤ Heavy elec	٠.٠٤٥	-٠.٠٠٤	٠.٠٢٨	٠.٠١١	٠.٠٠٢	٠.٠٠٢	٠.٠٠٥	-٠.٠٣٠	-٠.٠١٦	٠.٠٣٠	٠.٠٢٤	٠.٠٤٢
٤٥ Oth light	٠.٠٧٨	٠.٠١٨	٠.٠٥٢	٠.٠٠٨	٠.٠٠١	٠.٠٠٣	٠.٠٠٠	٠.٠٠٠	٠.٠٠٠	٠.٠٦٩	٠.٠١٧	٠.٠٤٩
٤٦ Motor vehi	-٠.٠٣٦	٠.٠٣٣	-٠.٠٠١	٠.٠١٢	٠.٠٠٢	٠.٠٠٥	٠.٠٠٢	-٠.٠١٤	-٠.٠٠٥	-٠.٠٤٠	٠.٠٤٦	-٠.٠٠٢
٤٧ Other vehi	٠.٠٧٨	٠.٠١٤	٠.٠٥١	٠.٠١٠	٠.٠٠١	٠.٠٠٢	٠.٠٠٤	-٠.٠١٩	-٠.٠٠٧	٠.٠٦٤	٠.٠٣٢	٠.٠٥٦
٤٨ Other tran	-٠.٠٠٥	٠.٠١٥	٠.٠٠٨	٠.٠٠٧	٠.٠٠١	٠.٠٠٣	-٠.٠١٥	٠.٠٠١	-٠.٠٠٧	٠.٠٠٢	٠.٠١٣	٠.٠١٢
٤٩ Precision	٠.٠٠٦	٠.٠٠٨	٠.٠١٢	٠.٠٠٩	٠.٠٠١	٠.٠٠٣	-٠.٠١٠	٠.٠٠٨	-٠.٠٠٢	٠.٠٠٧	-٠.٠٠٢	٠.٠١٢
٥٠ Mfg miscel	٠.٠١٠	٠.٠٠٥	٠.٠١٤	٠.٠٠٨	٠.٠٠١	٠.٠٠٣	-٠.٠٠١	٠.٠٠٠	-٠.٠٠١	٠.٠٠٤	٠.٠٠٥	٠.٠١١
٥٤ Elec power	٠.٠٤٨	٠.٠٢٩	٠.٠٤٨	٠.٠٠٥	-٠.٠٠١	٠.٠٠٠	٠.٠١١	-٠.٠٠٥	٠.٠٠٤	٠.٠٣٦	٠.٠٢٢	٠.٠٣٧
٥٥ City gas	٠.٠٧٩	٠.٠٥٨	٠.٠٦٥	٠.٠٠٤	٠.٠٠٠	٠.٠٠١	٠.٠٢٧	-٠.٠١٤	٠.٠٠٤	٠.٠٥٦	٠.٠٥١	٠.٠٥١
٥٦ Water & se	-٠.٠٠٧	٠.٠٠٦	-٠.٠٠١	٠.٠٠٧	٠.٠٠٠	٠.٠٠١	٠.٠٣٦	-٠.٠٣٦	-٠.٠٠٢	-٠.٠٢١	٠.٠٠١	-٠.٠١٢
٥٧ Trade	٠.٠٦٢	-٠.٠٠٢	٠.٠٣٧	٠.٠٠٩	٠.٠٠٣	٠.٠٠٦	٠.٠٠٣	٠.٠٠٤	٠.٠٠٥	٠.٠٥٦	-٠.٠٠٦	٠.٠٣٢
٥٨ Finance	٠.٠٤٣	٠.٠١٢	٠.٠٣٨	٠.٠١٣	٠.٠٠٢	٠.٠٠٥	٠.٠١١	٠.٠٠٥	٠.٠٠٩	٠.٠٣٦	٠.٠١٩	٠.٠٣٤
٥٩ Transport	٠.٠٣٧	٠.٠٠٢	٠.٠٢٨	٠.٠٠٤	٠.٠٠٠	٠.٠٠٣	٠.٠١٠	٠.٠٠٥	٠.٠٠٨	٠.٠٢٤	-٠.٠٠٤	٠.٠١٩
٦٠ Communicat	٠.٠٨٥	٠.٠٩٨	٠.٠٧٣	٠.٠٠٥	٠.٠٠٠	٠.٠٠٣	٠.٠٠١	٠.٠٠٤	٠.٠٠٢	٠.٠٧٩	٠.١٢٠	٠.٠٨٠
٦٢ Oth public	٠.٠٣٩	٠.٠١٩	٠.٠٣٩	٠.٠١٤	-٠.٠٠٢	٠.٠٠٥	٠.٠٠٤	-٠.٠٠٥	-٠.٠٠١	٠.٠٠١	-٠.٠٠٩	-٠.٠٠١
٦٣ Inform ser	٠.٠١٨	٠.١٣٤	٠.٠٦٤	٠.٠٠٢	٠.٠٠٠	٠.٠٠٣	٠.٠١١	٠.٠٠٥	٠.٠٠٧	-٠.٠٣٧	٠.٠٥٣	-٠.٠٣١
٦٤ Buisnes se	٠.٠٤٩	٠.٠٢٩	٠.٠٤٨	٠.٠٠٥	٠.٠٠١	٠.٠٠٣	٠.٠٠١	-٠.٠٢٣	-٠.٠١٠	٠.٠٢٣	٠.٠١٧	٠.٠٢٨
٦٥ Persnl Ser	٠.٠٢١	٠.٠٠٩	٠.٠٢٤	#DIV/٠!	#DIV/٠!	#DIV/٠!	٠.٠٠١	٠.٠٠٨	٠.٠٠٦	٠.٠٠٢	٠.٠٠٢	٠.٠١١

note: ٥ sectors were deleted due to the lack of trade and employment data.