National Accounting Review

http://www.aimspress.com/journal/NAR

NAR, 2(2): 110–137.
DOI:10.3934/NAR.2020007
Received: 12 January 2020
Accepted: 04 March 2020
Published: 09 March 2020

Research article

Technology intensity and ownership in the Chinese manufacturing industry: A labor productivity decomposition approach

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Supplementary

Table S1. Industrial sectors.

Industry code	Industrial sector	Technology intensity
13	Agricultural products processing	low
14	Food manufacturing	low
15	Beverage manufacturing	low
16	Tobacco manufacturing*	low
17	Textile manufacturing	low
18	Garments, footwear and hats manufacturing	low
19	Leather and leather products manufacturing	low
20	Wood processing and wood products manufacturing	low
21	Furniture manufacturing	low
22	Paper and paper products manufacturing	low
23	Printing and audiovisual products manufacturing	low
24	Stationary and sports utility manufacturing	low
25	Petroleum processing, coking and nuclear fuel processing	medium
26	Chemical material and chemical products manufacturing	medium
27	Pharmaceutical industry	high
28	Synthetic fabric manufacturing	medium
29	Rubber manufacturing	medium
30	Plastic manufacturing	medium
31	Non-metallic mineral processing	medium
32	Ferrous metal smelting and rolling	medium
33	Nonferrous metal smelting and rolling	medium
34	Metal products manufacturing	medium
35	General-purpose equipment manufacturing	medium
36	Special equipment manufacturing	medium
37	Transport equipment manufacturing	medium

Table S1. Industrial sectors (continued).

Industry code	Industrial sector	Technology intensity
39	Electric apparatus manufacturing	medium
40	Communication equipment, computers, and other electronic equipment manufacturing	high
41	Meters and business machinery manufacturing	high
42	Art ware and other manufacturing*	unclassified
43	Waste recycling and processing†	low

* These sectors are removed from the sample. See the main text for explanations.

† All the observations in this sector are removed because of missing values in the input-output variables when we convert the nominal values into real ones.

Table S2. Labor productivity.

Sector	Technology intensity	Ownership	Labor productivity 1998	Labor productivity 2007	Labor productivity growth
13	low	state	33.30	130.07	290.57
13	low	private	44.73	140.76	214.65
13	low	foreign	82.68	161.76	95.65
14	low	state	24.96	125.42	402.51
14	low	private	33.90	115.45	240.56
14	low	foreign	71.14	165.08	132.04
15	low	state	42.45	184.49	334.65
15	low	private	40.63	149.56	268.06
15	low	foreign	100.99	247.71	145.27
17	low	state	15.57	63.29	306.59
17	low	private	22.82	77.40	239.14
17	low	foreign	37.45	70.69	88.75
18	low	state	21.40	62.20	190.62
18	low	private	26.92	58.48	117.22
18	low	foreign	26.96	47.24	75.23
19	low	state	22.54	75.05	233.02
19	low	private	33.86	66.35	95.96
19	low	foreign	23.69	42.31	78.62
20	low	state	20.84	97.28	366.89
20	low	private	28.41	93.25	228.25
20	low	foreign	44.49	84.94	90.89
21	low	state	26.11	96.43	269.29
21	low	private	33.04	77.05	133.21
21	low	foreign	45.04	55.94	24.20
22	low	state	22.82	124.17	444.16
22	low	private	28.33	103.36	264.87
22	low	foreign	60.72	165.48	172.54
23	low	state	26.50	107.59	306.03
23	low	private	28.92	96.05	232.16
23	low	foreign	63.15	97.39	54.22
24	low	state	22.99	83.27	262.26
24	low	private	22.97	55.85	143.13
24	low	foreign	25.31	37.53	48.33
25	medium	state	66.70	204.04	205.91
25	medium	private	41.61	131.11	215.06
25	medium	foreign	65.06	285.99	339.60
26	medium	state	25.87	123.67	378.13
26	medium	private	35.13	135.68	286.21
26	medium	foreign	108.84	333.52	206.42
27	high	state	35.59	141.35	297.11
27	high	private	46.53	171.01	267.48
27	high	foreign	96.65	263.53	172.65
28	medium	state	35.75	100.84	182.09

Table S2. Labor productivity (continued).

Sector	Technology intensity	Ownership	Labor productivity 1998	Labor productivity 2007	Labor productivity growth
28	medium	private	55.01	173.16	214.76
28	medium	foreign	63.24	210.71	233.20
29	medium	state	25.86	109.37	322.97
29	medium	private	24.42	100.81	312.85
29	medium	foreign	45.14	92.74	105.47
30	medium	state	28.68	105.92	269.37
30	medium	private	35.22	89.93	155.31
30	medium	foreign	45.71	75.79	65.82
31	medium	state	18.87	93.51	395.68
31	medium	private	21.92	104.22	375.40
31	medium	foreign	47.59	120.25	152.69
32	medium	state	34.13	219.89	544.23
32	medium	private	35.51	196.93	454.57
32	medium	foreign	69.48	408.30	487.67
33	medium	state	28.06	142.60	408.15
33	medium	private	46.38	152.38	228.51
33	medium	foreign	61.02	189.97	211.34
34	medium	state	23.80	96.57	305.67
34	medium	private	29.80	97.63	227.61
34	medium	foreign	61.47	98.03	59.47
35	medium	state	18.77	125.26	567.46
35	medium	private	25.33	103.35	308.08
35	medium	foreign	70.03	153.36	118.99
36	medium	state	15.52	98.46	534.28
36	medium	private	29.15	119.93	311.42
36	medium	foreign	57.82	133.56	131.01
37	medium	state	27.98	176.05	529.16
37	medium	private	35.96	130.44	262.77
37	medium	foreign	101.14	272.82	169.75
39	medium	state	31.48	156.35	396.63
39	medium	private	44.40	117.17	163.93
39	medium	foreign	66.55	98.81	48.47
40	high	state	50.56	131.87	160.83
40	high	private	73.55	166.86	126.86
40	high	foreign	88.59	168.53	90.24
41	high	state	15.93	99.17	522.64
41	high	private	29.12	121.18	316.09
41	high	foreign	57.09	122.91	115.29

Units: 1,000 RMB per person for labor productivity and percent for productivity growth. We report the cumulative growth rates over 1998–2007, i.e., $\left(y^{2007}/y^{1998} - 1\right) \times 100\%$.

Table S3. Growth decomposition: the efficiency change effect.

Sector	Technology intensity	Ownership	EFF	EFF_i	EFF_{ik}	$GEFF_i$	$GEFF_{ik}$
13	low	state	0.00	0.00	0.00	0.00	0.00
13	low	private	31.72	0.00	0.00	31.72	0.00
13	low	foreign	0.30	0.00	0.00	0.30	0.00
14	low	state	129.69	60.97	-7.25	42.69	73.55
14	low	private	53.58	20.79	10.55	27.13	9.27
14	low	foreign	3.39	16.21	16.21	-11.04	0.00
15	low	state	0.00	0.00	0.00	0.00	0.00
15	low	private	74.46	21.88	0.00	43.14	21.88
15	low	foreign	7.78	0.00	0.00	7.77	0.00

Table S3. Growth decomposition: the efficiency change effect (continued).

Sector	Technology intensity	Ownership	EFF	EFF_i	EFF_{ik}	$GEFF_i$	$GEFF_{ik}$
17	low	state	0.00	0.00	0.00	0.00	0.00
17	low	private	57.68	44.75	57.68	8.93	-8.20
17	low	foreign	18.53	8.49	41.81	9.25	-23.49
18	low	state	30.96	32.01	-15.54	-0.80	56.30
18	low	private	24.73	24.73	24.73	0.00	0.00
18	low	foreign	30.12	29.38	0.94	0.57	28.17
19	low	state	56.47	36.03	6.27	15.02	28.01
19	low	private	0.00	0.00	0.00	0.00	0.00
19	low	foreign	10.38	22.65	0.00	-10.02	22.65
20	low	state	46.34	38.54	-3.59	5.62	43.70
20	low	private	33.42	29.65	29.65	2.91	0.00
20	low	foreign	-4.29	35.02	25.06	-29.11	7.97
21	low	state	21.50	39.78	5.07	-13.07	33.03
21	low	private	41.00	20.28	2.37	17.22	17.50
21	low	foreign	28.96	-13.71	-10.86	49.45	-3.19
22	low	state	39.75	1.38	-2.86	37.85	4.36
22	low	private	101.85	56.74	19.53	28.78	31.13
22	low	foreign	67.40	36.17	36.17	22.94	0.00
23	low	state	50.60	29.03	-24.88	16.71	71.76
23	low	private	54.58	18.86	2.18	30.06	16.32
23	low	foreign	15.71	-10.76	-13.03	29.67	2.61
24	low	state	25.98	48.35	0.00	-15.08	48.35
24	low	private	-5.14	-0.44	4.32	-4.73	-4.56
24	low	foreign	-40.69	3.12	-13.33	-42.48	18.98
25	medium	state	0.00	0.00	0.00	0.00	0.00
25	medium	private	81.40	30.21	11.46	39.31	16.82
25	medium	foreign	33.34	33.63	50.81	-0.22	-11.39
26	medium	state	0.00	0.00	0.00	0.00	0.00
26	medium	private	89.53	26.37	2.35	49.97	23.47
26	medium	foreign	0.00	0.00	0.00	0.00	0.00
27	high	state	37.29	56.69	0.00	-12.38	56.69
27	high	private	28.38	28.38	28.38	0.00	0.00
27	high	foreign	0.00	0.00	0.00	0.00	0.00
28	medium	state	16.66	38.88	20.35	-15.99	15.39
28	medium	private	58.40	49.24	-12.07	6.15	69.72
28	medium	foreign	14.25	14.78	27.90	-0.46	-10.26
29	medium	state	12.05	-4.94	-9.51	17.87	5.05
29	medium	private	39.02	8.34	5.84	28.32	2.36
29	medium	foreign	8.05	13.48	-7.51	-4.78	22.70
30	medium	state	13.15	6.07	0.08	6.68	5.99
30	medium	private	29.13	28.98	6.60	0.12	20.99
30	medium	foreign	56.02	35.54	35.54	15.11	0.00
31	medium	state	0.00	0.00	0.00	0.00	0.00
31	medium	private	164.64	1.18	64.01	161.57	-38.31
31	medium	foreign	128.43	128.35	128.35	0.03	0.00
32	medium	state	0.00	0.00	0.00	0.00	0.00
32	medium	private	80.55	33.07	13.84	35.70	16.89
32	medium	foreign	56.66	56.66	56.66	0.00	0.00
33	medium	state	162.10	48.30	0.00	76.74	48.30
33	medium	private	58.58	10.00	0.00	44.15	10.00
33	medium	foreign	31.33	76.08	58.58	-25.42	11.04
34	medium	state	-5.40	30.33	0.00	-27.42	30.33
34	medium	private	1.87	2.36	2.36	-0.48	0.00
34	medium	foreign	30.61	19.02	19.02	9.73	0.00
35	medium	state	0.00	0.00	0.00	0.00	0.00
35	medium	private	41.62	34.41	8.74	5.36	23.61

Table S3. Growth decomposition: the efficiency change effect (continued).

Sector	Technology intensity	Ownership	EFF	EFF_i	EFF_{ik}	$GEFF_i$	$GEFF_{ik}$
35	medium	foreign	25.81	18.42	18.42	6.24	0.00
36	medium	state	0.00	0.00	0.00	0.00	0.00
36	medium	private	33.79	34.43	8.75	-0.48	23.61
36	medium	foreign	42.78	13.74	0.00	25.53	13.74
37	medium	state	0.00	0.00	0.00	0.00	0.00
37	medium	private	21.13	21.71	21.71	-0.48	0.00
37	medium	foreign	7.62	0.00	7.62	7.62	-7.08
39	medium	state	0.00	0.00	0.00	0.00	0.00
39	medium	private	0.08	0.00	0.00	0.08	0.00
39	medium	foreign	0.00	0.00	0.00	0.00	0.00
40	high	state	0.00	0.00	0.00	0.00	0.00
40	high	private	0.00	0.00	0.00	0.00	0.00
40	high	foreign	0.00	0.00	0.00	0.00	0.00
41	high	state	193.74	110.17	118.83	39.76	-3.96
41	high	private	51.23	31.62	31.62	14.89	0.00
41	high	foreign	32.75	28.83	0.00	3.04	28.83

Note: EFF and related variables are evaluated over the 1998–2007 period and converted into cumulative growth rates (unit: percent). That is, $\mathrm{EFF} = \left(\frac{e^{2007}\left(\mathbf{x}^{2007},y^{2007}\right)}{e^{1998}\left(\mathbf{x}^{1998},y^{1998}\right)} - 1\right) \times 100\%$, and similarly for the others.

Table S4. Growth decomposition: the technology change effect.

Sector	Technology intensity	Ownership	TECH	$TECH_i$	$TECH_{ik}$	$GTECH_i$	$GTECH_{ik}$
13	low	state	0.00	0.00	0.00	0.00	0.00
13	low	private	16.98	15.88	40.92	0.95	-17.77
13	low	foreign	54.56	35.09	11.92	14.42	20.70
14	low	state	152.61	151.09	105.62	0.60	22.12
14	low	private	42.51	40.71	49.56	1.28	-5.92
14	low	foreign	67.40	47.25	44.04	13.69	2.23
15	low	state	31.64	25.03	0.00	5.29	25.03
15	low	private	42.29	38.66	57.34	2.62	-11.87
15	low	foreign	47.30	52.62	24.60	-3.48	22.49
17	low	state	0.00	0.00	0.00	0.00	0.00
17	low	private	-5.69	58.76	36.01	-40.60	16.73
17	low	foreign	44.78	68.64	15.92	-14.15	45.48
18	low	state	116.90	116.03	131.95	0.40	-6.86
18	low	private	35.68	35.68	35.68	0.00	0.00
18	low	foreign	38.61	2.84	-6.69	34.79	10.22
19	low	state	103.95	130.32	196.40	-11.45	-22.29
19	low	private	35.68	35.68	35.68	0.00	0.00
19	low	foreign	43.03	22.11	-12.67	17.12	39.82
20	low	state	130.70	94.34	229.41	18.71	-41.00
20	low	private	42.84	40.00	39.06	2.03	0.67
20	low	foreign	161.90	96.86	101.09	33.03	-2.10
21	low	state	102.33	105.97	183.41	-1.77	-27.33
21	low	private	42.27	42.94	54.93	-0.47	-7.74
21	low	foreign	127.32	115.16	109.63	5.65	2.64
22	low	state	59.61	98.12	98.38	-19.44	-0.13
22	low	private	42.44	38.31	61.57	2.99	-14.40
22	low	foreign	43.21	49.09	46.14	-3.95	2.02
23	low	state	105.99	202.46	313.91	-31.89	-26.93
23	low	private	58.80	62.90	73.19	-2.51	-5.94
23	low	foreign	90.11	192.28	87.73	-34.96	55.69
24	low	state	104.07	98.93	181.30	2.59	-29.28

Table S4. Growth decomposition: the technology change effect (continued).

Sector	Technology intensity	Ownership	TECH	$TECH_i$	$TECH_{ik}$	$GTECH_i$	$GTECH_{ik}$
24	low	private	153.79	93.57	89.10	31.11	2.36
24	low	foreign	119.61	62.15	48.53	35.43	9.17
25	medium	state	0.00	0.00	0.00	0.00	0.00
25	medium	private	47.76	49.50	61.37	-1.17	-7.36
25	medium	foreign	299.91	270.10	239.60	8.06	8.98
26	medium	state	0.00	0.00	0.00	0.00	0.00
26	medium	private	-5.08	5.52	27.28	-10.05	-17.10
26	medium	foreign	24.70	30.13	10.34	-4.19	17.94
27	high	state	42.06	30.79	33.03	8.61	-1.68
27	high	private	42.40	42.20	36.63	0.15	4.08
27	high	foreign	42.81	41.66	43.53	0.81	-1.30
28	medium	state	187.80	103.69	261.90	41.30	-43.72
28	medium	private	60.05	52.30	88.09	5.09	-19.03
28	medium	foreign	309.93	281.19	252.03	7.54	8.28
29	medium	state	138.51	168.09	281.60	-11.03	-29.75
29	medium	private	42.97	38.68	40.30	3.10	-1.16
29	medium	foreign	93.79	71.41	64.06	13.05	4.48
30	medium	state	249.34	153.58	253.06	37.76	-28.18
30	medium	private	62.95	40.17	54.17	16.25	-9.08
30	medium	foreign	60.28	50.61	42.21	6.42	5.91
31	medium	state	0.00	0.00	0.00	0.00	0.00
31	medium	private	-14.08	35.62	18.82	-36.64	14.14
31	medium	foreign	42.23	30.19	25.59	9.24	3.66
32	medium	state	0.00	0.00	0.00	0.00	0.00
32	medium	private	42.35	42.60	54.17	-0.18	-7.50
32	medium	foreign	54.39	52.69	51.32	1.11	0.91
33	medium	state	32.46	64.41	71.68	-19.43	-4.23
33	medium	private	42.28	47.00	54.17	-3.21	-4.65
33	medium	foreign	77.41	50.42	53.68	17.94	-2.12
34	medium	state	82.04	30.61	1.59	39.37	28.57
34	medium	private	62.14	38.68	17.20	16.93	18.33
34	medium	foreign	54.65	43.68	36.52	7.64	5.24
35	medium	state	0.00	0.00	0.00	0.00	0.00
35	medium	private	41.89	-2.67	30.30	45.77	-25.30
35	medium	foreign	50.55	38.96	32.68	8.34	4.73
36	medium	state	105.81	66.89	0.00	23.30	66.89
36	medium	private	61.86	38.68	30.30	16.71	6.43
36	medium	foreign	46.76	48.19	40.22	-0.97	5.69
37	medium	state	0.00	0.00	0.00	0.00	0.00
37	medium	private	61.75	38.68	17.20	16.65	18.33
37	medium	foreign	25.28	26.52	11.46	-0.98	13.51
39	medium	state	0.00	0.00	0.00	0.00	0.00
39	medium	private	34.69	38.66	5.95	-2.87	30.87
39	medium	foreign	20.43	18.98	-0.25	1.22	19.27
40	high	state	0.00	25.28	0.00	-20.19	25.28
40	high	private	42.26	42.20	24.04	0.05	14.64
40	high	foreign	0.00	0.00	0.00	0.00	0.00
41	high	state	113.40	116.08	113.08	-1.24	1.41
41	high	private	38.59	47.99	47.99	-6.36	0.00
41	high	foreign	48.42	50.65	49.10	-1.49	1.04

Note: TECH and related variables are evaluated over the 1998–2007 period and converted into cumulative growth rates (unit: percent). That is, $\text{TECH} = \left(\sqrt{\frac{y^{2007}(\mathbf{x}^{1998})}{y^{1998}(\mathbf{x}^{1998})} \frac{y^{2007}(\mathbf{x}^{2007})}{y^{1998}(\mathbf{x}^{2007})}} - 1 \right) \times 100\%$, and similarly for the others.

Table S5. Growth decomposition: the capital deepening effect.

Sector	Technology intensity	Ownership	KACC	$KACC_i$	$KACC_{ik}$	$GKACC_i$	$GKACC_{ik}$
13	low	state	290.57	290.57	290.57	0.00	0.00
13	low	private	104.20	171.54	123.29	-24.80	21.61
13	low	foreign	26.21	44.83	74.81	-12.86	-17.15
14	low	state	-13.39	24.33	163.48	-30.34	-52.81
14	low	private	55.60	100.34	105.97	-22.34	-2.73
14	low	foreign	34.07	35.59	38.61	-1.12	-2.18
15	low	state	230.19	247.64	334.65	-5.02	-20.02
15	low	private	48.27	117.78	133.92	-31.92	-6.90
15	low	foreign	54.50	60.71	96.84	-3.86	-18.35
17	low	state	306.59	306.59	306.59	0.00	0.00
17	low	private	128.05	47.57	58.14	54.54	-6.68
17	low	foreign	9.99	3.16	14.82	6.61	-10.15
18	low	state	2.31	1.90	48.35	0.40	-31.31
18	low	private	28.36	28.36	28.36	0.00	0.00
18	low	foreign	-2.84	31.71	86.05	-26.24	-29.21
19	low	state	4.36	6.29	5.73	-1.83	0.53
19	low	private	44.42	44.42	44.42	0.00	0.00
19	low	foreign	13.14	19.25	104.53	-5.12	-41.69
20	low	state	38.30	73.40	47.01	-20.24	17.95
20	low	private	72.24	80.86	82.07	-4.76	-0.67
20	low	foreign	-23.85	-28.18	-24.09	6.03	-5.38
21	low	state	50.22	28.28	24.02	17.11	3.43
21	low	private	16.26	35.66	47.04	-14.30	-7.74
21	low	foreign	-57.63	-33.11	-33.54	-36.66	0.64
22	low	state	143.95	170.91	182.37	-9.96	-4.06
22	low	private	26.91	68.32	88.94	-24.60	-10.91
22	low	foreign	13.68	34.25	36.96	-15.32	-1.98
23	low	state	30.88	4.03	30.58	25.80	-20.33
23	low	private	35.31	71.56	87.70	-21.13	-8.60
23	low	foreign	-29.89	-40.86	-5.53	18.57	-37.40
24	low	state	40.91	22.75	28.78	14.80	-4.68
24	low	private	0.99	26.16	23.25	-19.95	2.36
24	low	foreign	13.87	-11.29	15.22	28.37	-23.01
25	medium	state	205.91	205.91	205.91	0.00	0.00
25	medium	private	17.55	61.84	75.16	-27.37	-7.60
25	medium	foreign	-17.56	-11.11	-14.17	-7.25	3.56
26	medium	state	378.13	378.13	378.13	0.00	0.00
26	medium	private	114.68	189.62	196.46	-25.88	-2.31
26	medium	foreign	145.73	135.46	177.70	4.36	-15.21
27	high	state	103.62	93.79	198.52	5.08	-35.08
27	high	private	101.02	101.31	109.52	-0.15	-3.92
27	high	foreign	90.92	92.46	89.96	-0.80	1.32
28	medium	state	-15.98	-0.28	-35.23	-15.75	53.96
28	medium	private	24.15	38.49	90.32	-10.35	-27.24
28	medium	foreign	-28.86	-23.85	-26.00	-6.58	2.90
29	medium	state	58.26	65.96	22.48	-4.64	35.50
29	medium	private	107.71	174.79	178.01	-24.41	-1.16
29	medium	foreign	-1.87	5.63	35.41	-7.10	-21.99
30	medium	state	-6.56	37.32	4.53	-31.95	31.37
30	medium	private	21.34	41.24	55.35	-14.09	-9.08
30	medium	foreign	-33.69	-18.77	-13.97	-18.37	-5.58
31	medium	state	395.68	395.68	395.68	0.00	0.00
31	medium	private	109.07	246.44	143.96	-39.66	42.01
31	medium	foreign	-22.22	-15.00	-11.89	-8.49	-3.53
32	medium	state	544.23	544.23	544.23	0.00	0.00
32	medium	private	115.77	192.28	215.98	-26.18	-7.50

Table S5. Growth decomposition: the capital deepening effect (continued).

Sector	Technology intensity	Ownership	KACC	$KACC_i$	$KACC_{ik}$	$GKACC_i$	$GKACC_{ik}$
32	medium	foreign	142.98	145.69	147.90	-1.10	-0.89
33	medium	state	46.36	108.43	195.99	-29.78	-29.58
33	medium	private	45.61	103.17	113.08	-28.33	-4.65
33	medium	foreign	33.63	17.55	27.75	13.69	-7.99
34	medium	state	135.58	138.34	299.34	-1.16	-40.32
34	medium	private	98.33	130.80	173.08	-14.07	-15.48
34	medium	foreign	-21.05	-6.75	-1.86	-15.34	-4.98
35	medium	state	567.46	567.46	567.46	0.00	0.00
35	medium	private	103.09	211.96	188.03	-34.90	8.31
35	medium	foreign	15.62	33.08	39.37	-13.11	-4.52
36	medium	state	208.19	280.04	534.28	-18.90	-40.08
36	medium	private	90.00	120.71	190.34	-13.91	-23.98
36	medium	foreign	10.24	37.04	64.75	-19.56	-16.82
37	medium	state	529.16	529.16	529.16	0.00	0.00
37	medium	private	85.16	114.95	154.33	-13.86	-15.48
37	medium	foreign	100.07	113.21	124.87	-6.16	-5.19
39	medium	state	396.63	396.63	396.63	0.00	0.00
39	medium	private	95.81	90.33	149.10	2.88	-23.59
39	medium	foreign	23.27	24.78	48.84	-1.21	-16.16
40	high	state	160.83	108.18	160.83	25.28	-20.19
40	high	private	59.47	59.54	82.90	-0.05	-12.77
40	high	foreign	90.24	90.24	90.24	0.00	0.00
41	high	state	-0.67	37.09	33.53	-27.55	2.67
41	high	private	98.53	113.61	113.61	-7.05	0.00
41	high	foreign	9.27	10.92	44.39	-1.49	-23.18

Note: KACC and related variables are evaluated over the 1998–2007 period and converted into cumulative growth rates (unit: percent). That is, $\mathrm{KACC} = \left(\sqrt{\frac{y^{1998}(\mathbf{x}^{2007})}{y^{1998}(\mathbf{x}^{1998})} \frac{y^{2007}(\mathbf{x}^{2007})}{y^{2007}(\mathbf{x}^{1998})}} - 1 \right) \times 100\%$, and similarly for the others.

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