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Research article

Estimating SFLQ-based regional input-output tables for South Korean regions

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Supplementary

Appendix

Table A.1. SLQ_j for South Korea regions in 2015, sectors 1–17 and 18–33.

Region/Sector	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Gyeonggi-do	0.52	0.54	0.91	0.82	1.50	0.01	0.97	1.04	0.49	1.20	2.07	1.23	1.34	0.76	2.27	1.03	0.79
Seoul	0.01	0.01	0.10	2.60	0.59	0.00	0.06	0.06	0.02	0.10	0.13	0.14	0.12	0.00	0.41	0.55	0.23
Gyeongsangbuk-do	2.17	1.27	1.15	0.86	0.67	0.04	0.84	1.78	3.20	1.46	3.08	1.32	0.70	0.71	0.61	1.09	1.53
Gyeongsangnam-do	1.71	0.75	1.43	0.37	0.93	0.05	0.66	0.99	1.15	2.70	0.16	1.78	2.70	2.86	0.62	1.84	0.95
Ulsan	0.11	0.69	0.16	0.22	0.58	8.43	2.49	0.31	1.88	0.68	0.04	1.04	1.01	3.50	0.43	0.83	0.71
Jeollanam-do	3.14	1.37	0.93	0.09	0.28	5.11	3.32	1.35	2.67	0.44	0.02	0.14	0.22	0.52	0.26	0.67	2.39
Chungcheongnam-do	1.77	0.89	1.41	0.28	0.84	2.21	1.83	1.85	1.81	1.00	1.76	1.48	1.10	1.31	0.28	1.61	1.91
Incheon	0.20	1.10	0.94	0.37	1.51	0.96	0.83	0.65	1.30	1.20	0.51	1.01	1.67	0.82	1.59	1.07	3.18
Busan	0.66	0.17	0.76	1.47	0.55	0.08	0.41	0.37	1.16	1.43	0.25	0.66	1.17	0.81	0.74	1.04	1.35
Chungcheongbuk-do	1.66	2.36	3.35	0.46	1.90	0.03	1.81	2.99	0.57	1.17	1.95	2.70	0.69	0.49	1.46	1.37	0.24
Daegu	0.27	0.03	0.76	2.10	1.42	0.00	0.47	0.51	0.41	2.13	0.33	0.99	1.51	0.75	0.83	1.32	0.53
Jeollabuk-do	3.39	2.25	3.32	0.56	1.70	0.02	1.17	1.68	1.18	0.60	0.15	0.47	0.85	1.84	0.84	0.83	0.79
Gangwon-do	3.33	16.01	2.31	0.09	0.30	0.03	0.27	3.84	0.26	0.29	0.15	0.37	0.22	0.35	0.64	0.41	0.65
Gwangju	0.23	0.15	0.72	0.31	0.50	0.00	0.61	0.29	0.56	0.91	0.31	2.45	1.37	2.77	0.64	1.35	0.33
Daejeon	0.16	0.09	2.39	0.33	1.93	0.00	1.01	0.51	0.18	0.68	0.70	0.91	1.16	0.20	0.87	0.34	0.42
Jeju-do	5.50	2.43	1.26	0.05	0.26	0.00	0.10	1.39	0.00	0.13	0.06	0.05	0.05	0.00	0.41	0.22	0.70
Sejong	1.15	2.53	1.68	0.11	3.15	0.01	1.33	5.02	0.22	0.21	1.09	1.84	0.11	0.30	0.30	0.99	1.61
	18	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**Mean 1–33**
Gyeonggi-do	1.13	1.10	0.85	0.72	0.96	0.94	0.62	1.02	1.19	0.84	0.97	0.93	0.87	1.06	0.99	1.06	**0.99**
Seoul	0.47	0.71	2.35	1.11	1.42	2.98	2.59	1.97	2.26	2.06	0.87	1.24	1.34	1.84	1.49	1.01	**0.93**
Gyeongsangbuk-do	1.26	1.05	0.40	0.53	0.62	0.32	0.39	0.42	0.47	0.43	0.86	0.75	0.61	0.48	0.59	0.72	**0.98**
Gyeongsangnam-do	1.22	0.99	0.54	0.64	0.84	0.32	0.58	0.67	0.46	0.58	0.99	0.82	0.87	0.49	0.75	0.87	**1.01**
Ulsan	0.49	0.47	0.21	0.63	0.35	0.11	0.24	0.29	0.35	0.41	0.23	0.38	0.33	0.19	0.30	0.40	**0.86**
Jeollanam-do	0.96	1.05	0.38	1.13	0.60	0.34	0.41	0.36	0.20	0.49	1.41	0.75	0.76	0.46	0.57	1.18	**1.03**

Continued on next page

Region/Sector	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Chungcheongnam-do	0.80	1.07	0.33	0.51	0.56	0.22	0.31	0.39	0.31	0.47	0.72	0.68	0.50	0.40	0.50	0.79	**0.97**
Incheon	1.68	0.93	0.76	3.42	0.97	0.24	0.65	0.92	0.61	0.82	0.86	0.98	0.92	0.66	0.84	0.94	**1.06**
Busan	1.18	1.04	1.29	2.56	1.36	0.50	1.29	1.18	0.85	1.23	1.06	1.26	1.58	1.11	1.33	1.00	**1.00**
Chungcheongbuk-do	1.31	0.96	0.48	0.46	0.80	0.37	0.48	0.53	0.45	0.71	1.03	0.91	0.78	0.45	0.74	1.11	**1.11**
Daegu	1.40	1.30	1.23	0.71	1.32	0.59	1.32	1.39	0.74	1.19	1.26	1.56	1.89	0.84	1.90	1.10	**1.03**
Jeollabuk-do	1.34	1.24	0.67	0.74	1.01	0.46	0.77	0.65	0.40	0.64	1.38	1.34	1.35	0.69	1.13	1.13	**1.11**
Gangwon-do	1.40	2.23	0.83	0.94	1.85	0.84	0.84	0.85	0.45	0.96	3.64	1.71	1.34	2.91	1.32	2.74	**1.65**
Gwangju	1.23	0.93	0.96	0.71	1.17	0.54	1.12	1.15	0.59	1.20	0.93	1.51	1.77	1.09	1.52	0.81	**0.93**
Daejeon	0.93	0.84	1.12	0.97	1.38	0.77	1.26	1.19	1.80	1.52	1.50	1.65	1.77	1.07	1.53	1.37	**0.99**
Jeju-do	1.16	2.30	1.39	1.52	2.71	1.51	0.99	1.15	0.47	2.11	1.90	1.50	1.44	4.12	1.38	1.48	**1.20**
Sejong	0.91	3.83	0.24	0.37	0.71	0.39	0.39	0.82	0.53	0.43	2.75	1.02	0.40	0.35	0.41	2.49	**1.14**

Source: The results are based on calculations performed by the authors.

Table A.2. Explanatory variables (IM, VA, and CL) in Kowalewski's sector-specific approach for South Korea regions in 2015. The mean, variance, and coefficient of variation of each regression coefficient. Kowalewski's regression Equation (9).

Sector	Description	IM	VA	CL
1	Agricultural, forest, and fishery goods	0.067	0.542	0.463
2	Mined and quarried goods	0.014	0.518	0.440
3	Food, beverages, and tobacco products	0.172	0.251	0.274
4	Textile and leather products	0.354	0.193	0.358
5	Wood and paper products, printing and reproduction of recorded media	0.208	0.312	0.231
6	Petroleum and coal products	0.805	0.308	0.755
7	Chemical products	0.320	0.289	0.300
8	Non-metallic mineral products	0.116	0.314	0.308
9	Basic metal products	0.416	0.202	0.386
10	Fabricated metal products, except machinery and furniture	0.101	0.359	0.263
11	Computing machinery, electronic equipment, and optical instruments	0.406	0.333	0.478
12	Electrical equipment	0.212	0.305	0.259
13	Machinery and equipment	0.172	0.294	0.269
14	Transport equipment	0.142	0.192	0.369
15	Other manufactured products	0.155	0.280	0.335
16	Manufacturing services and repair services of industrial equipment	0.053	0.491	0.149
17	Electricity, gas, and steam supply	0.579	0.368	0.296
18	Water supply, sewage, and waste treatment and disposal services	0.033	0.534	0.150
19	Construction	0.077	0.418	0.100
20	Wholesale and retail trade and commodity brokerage	0.060	0.547	0.282
21	Transportation	0.325	0.388	0.225
22	Food services and accommodation	0.081	0.345	0.148
23	Communications and broadcasting	0.136	0.539	0.381
24	Finance and insurance	0.064	0.588	0.332
25	Real estate services	0.022	0.764	0.217
26	Professional, scientific, and technical services	0.081	0.509	0.299
27	Public support services	0.102	0.699	0.240
28	Public administration, defense, and social security services	0.081	0.774	0.120
29	Education services	0.046	0.691	0.125
30	Health and social care services	0.132	0.528	0.168
31	Art, sports, and leisure services	0.056	0.552	0.244
32	Other services	0.053	0.444	0.168
33	Others	0.000	0.000	0.088
Mean		**0.171**	**0.420**	**0.279**
Stdev		**0.177**	**0.178**	**0.134**
V		**1.036**	**0.423**	**0.480**

Note: IM_j represents the foreign imports intensity of national intermediate inputs; VA_j is the value added intensity of national inputs; $CL_j$is used to refer to the coefficient of localization. Source: The results are based on calculations performed by the authors.

Table A.3. Results of the regression analysis using Kowalewski's model (9).

	Kowalewski	**Results for South Korea**	
	Germany	**Gyeonggi-do**	**Seoul**
Intercept	–0.009	0.452**	0.461***
	(–0.08)	(3.302)	(1.854)
CL_j	1.266***	0.560*	0.278
	(4.49)	(2.220)	(0.224)
SLQ_j	–0.025	–0.122	–0.246
	(–0.38)	(–1.843)	(–1.902)
IM_j	–0.230	–0.192	0.635
	(–0.64)	(–0.948)	(0.924)
VA_j	0.124	0.126	0.219
	(1.12)	(0.786)	(0.613)
R^2	0.67	0.310	0.589
n	21	33	33

Note: t-statistics are in brackets.

Source: Kowalewski (2015, Table 8); authors' own calculations for the results for South Korea.

Table A.4. Results of the regression analysis using Kowalewski's model (9)

	Gyeongsangbuk-do	**Gyeongsangnam-do**	**Ulsan**	**Jeollanam-do**
Intercept	0.512***	0.340**	0.687*	0.723***
	(5.727)	(2.965)	(2.746)	(3.829)
CL_j	–0.306	0.437	–0.352	–0.131
	(–1.409)	(1.839)	(–0.802)	(–0.335)
SLQ_j	–0.065	–0.085*	–0.041	–0.212***
	(–2.017)	(–2.381)	(–0.658)	(–4.084)
IM_j	0.029	0.035	–0.228	0.438
	(0.164)	(0.171)	(–0.438)	(1.282)
VA_j	–0.045	–0.133	–0.111	–0.336
	(–0.325)	(–0.890)	(–0.326)	(–1.234)
R^2	0.229	0.305	0.073	0.517
n	33	33	33	33

Note: t-statistics are in brackets.

Source: The results are based on calculations performed by the authors.

Table A.5. Results of the regression analysis using Kowalewski's model (9)

	Chungcheongnam-do	**Incheon**	**Busan**	**Chungcheongbuk-do**
Intercept	0.583***	0.429***	0.397**	0.540***
	(4.967)	5.230)	(4.770)	(4.156)
CL_j	–0.133	0.375	0.336	–0.304
	(–0.482)	(1.811)	(1.716)	(–1.049)
SLQ_j	–0.187**	–0.111**	–0.208***	–0.093*
	(–3.097)	(–3.356)	(–4.992)	(–2.412)
IM_j	0.354	–0.166	0.070	0.201
	(1.529)	(–0.966)	(0.521)	(0.820)
VA_j	–0.039	–0.014	0.040	–0.164
	(–0.216)	(–0.124)	(0.403)	(–0.858)
R^2	0.293	0.524	0.718	0.250
n	33	33	33	33

Note: t-statistics are in brackets.

Source: The results are based on calculations performed by the authors.

Table A.6. Results of the regression analysis using Kowalewski's model (9).

	Daegu	**Jeollabuk-do**	**Gangwon-do**	**Gwangju**
Intercept	0.260**	0.427***	0.498***	0.166
	(3.587)	(3.740)	(5.014)	(1.403)
CL_j	0.608***	0.163	0.195	0.977***
	(3.909)	(0.602)	(0.926)	(3.900)
SLQ_j	–0.118***	–0.097*	–0.093***	–0.095*
	(–4.084)	(–2.378)	(–4.239)	(–2.270)
IM_j	–0.049	–0.161	–0.065	–0.081
	(–0.441)	(–0.800)	(–0.378)	(–0.404)
VA_j	–0.056	–0.204	–0.381*	–0.083
	(–0.752)	(–1.481)	(–2.666)	(–0.583)
R^2	0.745	0.250	0.705	0.558
n	33	33	33	33

Note: t-statistics are in brackets.

Source: The results are based on calculations performed by the authors.

Table A.7. Results of the regression analysis using Kowalewski's model (9).

	Daejeon	**Jeju-do**	**Sejong**
Intercept	0.404**	0.471***	0.738***
	(3.432)	(4.642)	(5.622)
CL_j	0.832**	0.039	–0.214
	(3.184)	(0.148)	(–0.818)
SLQ_j	–0.190***	–0.223***	–0.058*
	(–4.165)	(–6.359)	(–2.476)
IM_j	–0.203	0.236	–0.207
	(–1.063)	(1.134)	(–0.963)
VA_j	–0.094	0.012	–0.500*
	(–0.686)	(0.084)	(–2.414)
R^2	0.679	0.755	0.286
n	33	33	33

Note: t-statistics are in brackets.

Source: The results are based on calculations performed by the authors.

Table A.8. Outcomes obtained through Kowalewski's industry-specific methodology.

Sector	Description	Gyeonggi-do		Seoul	
		δ_j	$\hat{\delta}_j$	δ_j	$\hat{\delta}_j$
1	Agricultural, forest, and fishery goods	0.563	0.704	1.000	0.749
2	Mined and quarried goods	0.824	0.695	1.000	0.703
3	Food, beverages, and tobacco products	0.330	0.492	1.000	0.677
4	Textile and leather products	0.639	0.508	0.259	0.187
5	Wood and paper products, printing and reproduction of recorded media	0.467	0.398	0.643	0.581
6	Petroleum and coal products	0.492	0.757	0.000	1.000
7	Chemical products	0.540	0.476	1.000	0.797
8	Non-metallic mineral products	0.464	0.515	1.000	0.674
9	Basic metal products	0.804	0.553	1.000	0.873
10	Fabricated metal products, except machinery and furniture	0.473	0.479	1.000	0.652
11	Computing machinery, electronic equipment, and optical instruments	0.694	0.431	1.000	0.892
12	Electrical equipment	0.514	0.445	1.000	0.700
13	Machinery and equipment	0.476	0.443	1.000	0.680
14	Transport equipment	0.751	0.562	1.000	0.695
15	Other manufactured products	0.056	0.368	1.000	0.613
16	Manufacturing services and repair services of industrial equipment	0.528	0.461	0.361	0.509
17	Electricity, gas, and steam supply	0.367	0.457	1.000	0.935
18	Water supply, sewage, and waste treatment and disposal services	0.363	0.460	1.000	0.525
19	Construction	0.519	0.411	0.827	0.456
20	Wholesale and retail trade and commodity brokerage	0.614	0.564	0.000	0.119
21	Transportation	0.480	0.477	0.421	0.543
22	Food services and accommodation	0.305	0.445	0.173	0.280
23	Communications and broadcasting	0.677	0.592	0.117	0.037
24	Finance and insurance	0.661	0.624	0.138	0.086
25	Real estate services	0.514	0.541	0.210	0.218
26	Professional, scientific, and technical services	0.482	0.523	0.000	0.150
27	Public support services	0.527	0.553	0.227	0.239
28	Public administration, defense, and social security services	0.419	0.483	0.634	0.501
29	Education services	0.507	0.487	0.364	0.371
30	Health and social care services	0.558	0.481	0.195	0.377
31	Art, sports, and leisure services	0.395	0.518	0.127	0.233
32	Other services	0.561	0.472	0.192	0.272
33	Others	0.161	0.372	0.000	0.237
Mean		**0.507**	**0.507**	**0.572**	**0.502**

Note: $\hat{\delta}_j$ is from the regression (9), and δ_j is the value that minimizes MAPE for the sectoral multipliers. Source: The results are based on calculations performed by the authors.

Table A.9. Outcomes obtained through Kowalewski's industry-specific methodology.

Sector	Description	Gyeongs-angbuk-do		Gyeongs-angnam-do	
		δ_j	$\hat{\delta}_j$	δ_j	$\hat{\delta}_j$
1	Agricultural, forest, and fishery goods	0.065	0.207	0.114	0.327
2	Mined and quarried goods	0.146	0.272	0.305	0.400
3	Food, beverages, and tobacco products	0.313	0.347	0.296	0.311
4	Textile and leather products	0.272	0.348	0.491	0.452
5	Wood and paper products, printing and reproduction of recorded media	0.401	0.390	0.322	0.327
6	Petroleum and coal products	0.153	0.288	1.000	0.653
7	Chemical products	0.389	0.362	0.365	0.387
8	Non-metallic mineral products	0.256	0.291	0.266	0.353
9	Basic metal products	0.291	0.189	0.248	0.398
10	Fabricated metal products, except machinery and furniture	0.426	0.324	0.213	0.182
11	Computing machinery, electronic equipment, and optical instruments	0.203	0.162	0.728	0.505
12	Electrical equipment	0.516	0.339	0.347	0.269
13	Machinery and equipment	0.574	0.376	0.233	0.195
14	Transport equipment	0.456	0.348	0.467	0.238
15	Other manufactured products	0.542	0.362	0.492	0.402
16	Manufacturing services and repair services of industrial equipment	0.272	0.375	0.071	0.186
17	Electricity, gas, and steam supply	0.297	0.322	0.204	0.360
18	Water supply, sewage, and waste treatment and disposal services	0.153	0.361	0.119	0.232
19	Construction	0.396	0.397	0.364	0.247
20	Wholesale and retail trade and commodity brokerage	0.404	0.377	0.349	0.347
21	Transportation	0.288	0.401	0.320	0.343
22	Food services and accommodation	0.355	0.413	0.270	0.290
23	Communications and broadcasting	0.349	0.354	0.338	0.412
24	Finance and insurance	0.266	0.361	0.221	0.360
25	Real estate services	0.450	0.385	0.239	0.277
26	Professional, scientific, and technical services	0.467	0.370	0.561	0.367
27	Public support services	0.446	0.382	0.315	0.306
28	Public administration, defense, and social security services	0.308	0.387	0.238	0.208
29	Education services	0.335	0.396	0.248	0.234
30	Health and social care services	0.522	0.401	0.319	0.274
31	Art, sports, and leisure services	0.516	0.383	0.508	0.333
32	Other services	0.537	0.404	0.463	0.292
33	Others	0.161	0.438	0.101	0.305
Mean		**0.349**	**0.349**	**0.337**	**0.326**

Note: $\hat{\delta}_j$ is from the regression (9), and δ_j is the value that minimizes MAPE for the sectoral multipliers. Source: The results are based on calculations performed by the authors.

Table A.10. Outcomes obtained through Kowalewski's industry-specific approach.

Sector	Description	Ulsan		Jeollanam-do	
		δ_j	$\hat{\delta}_j$	δ_j	$\hat{\delta}_j$
1	Agricultural, forest, and fishery goods	0.532	0.444	0.045	0.000
2	Mined and quarried goods	0.319	0.443	0.091	0.206
3	Food, beverages, and tobacco products	0.513	0.517	0.140	0.482
4	Textile and leather products	0.306	0.450	0.831	0.747
5	Wood and paper products, printing and reproduction of recorded media	0.429	0.500	0.579	0.619
6	Petroleum and coal products	0.000	0.000	0.000	0.000
7	Chemical products	0.048	0.375	0.000	0.024
8	Non-metallic mineral products	0.545	0.505	0.223	0.343
9	Basic metal products	0.417	0.357	0.318	0.222
10	Fabricated metal products, except machinery and furniture	0.613	0.504	0.726	0.520
11	Computing machinery, electronic equipment, and optical instruments	1.000	0.388	1.000	0.721
12	Electrical equipment	0.455	0.471	1.000	0.650
13	Machinery and equipment	0.480	0.479	0.917	0.617
14	Transport equipment	0.641	0.360	0.482	0.562
15	Other manufactured products	0.339	0.485	0.714	0.597
16	Manufacturing services and repair services of industrial equipment	0.224	0.534	0.346	0.419
17	Electricity, gas, and steam supply	0.000	0.381	0.181	0.308
18	Water supply, sewage, and waste treatment and disposal services	0.415	0.547	0.304	0.335
19	Construction	0.678	0.569	0.354	0.381
20	Wholesale and retail trade and commodity brokerage	0.665	0.505	0.455	0.448
21	Transportation	0.653	0.465	0.512	0.466
22	Food services and accommodation	0.307	0.564	0.304	0.497
23	Communications and broadcasting	0.664	0.458	0.209	0.480
24	Finance and insurance	0.272	0.480	0.184	0.424
25	Real estate services	0.376	0.509	0.443	0.370
26	Professional, scientific, and technical services	0.367	0.493	0.772	0.505
27	Public support services	0.406	0.485	0.380	0.398
28	Public administration, defense, and social security services	0.776	0.531	0.000	0.184
29	Education services	0.280	0.540	0.306	0.334
30	Health and social care services	0.873	0.526	0.627	0.420
31	Art, sports, and leisure services	0.614	0.519	0.435	0.434
32	Other services	0.957	0.554	0.548	0.455
33	Others	0.000	0.639	0.000	0.461
Mean		**0.459**	**0.472**	**0.407**	**0.413**

Note: $\hat{\delta}_j$is from the regression (9), and $\delta_j$is the value that minimizes the MAPE for the sectoral multipliers.
Source: The results are based on calculations performed by the authors.

Table A.11. Outcomes obtained through Kowalewski's industry-specific approach.

Sector	Description	Chung-cheongnam-do		Incheon	
		δ_j	$\hat{\delta}_j$	δ_j	$\hat{\delta}_j$
1	Agricultural, forest, and fishery goods	0.061	0.193	0.776	0.561
2	Mined and quarried goods	0.310	0.344	0.422	0.462
3	Food, beverages, and tobacco products	0.139	0.334	0.294	0.395
4	Textile and leather products	0.632	0.601	0.528	0.461
5	Wood and paper products, printing and reproduction of recorded media	0.418	0.457	0.382	0.310
6	Petroleum and coal products	0.174	0.343	0.286	0.467
7	Chemical products	0.383	0.303	0.491	0.392
8	Non-metallic mineral products	0.344	0.224	0.456	0.449
9	Basic metal products	0.343	0.332	0.390	0.357
10	Fabricated metal products, except machinery and furniture	0.475	0.383	0.439	0.373
11	Computing machinery, electronic equipment, and optical instruments	0.487	0.320	0.451	0.479
12	Electrical equipment	0.561	0.335	0.467	0.374
13	Machinery and equipment	0.530	0.390	0.360	0.312
14	Transport equipment	0.453	0.331	0.571	0.450
15	Other manufactured products	1.000	0.529	0.238	0.349
16	Manufacturing services and repair services of industrial equipment	0.227	0.262	0.312	0.350
17	Electricity, gas, and steam supply	0.277	0.377	0.126	0.086
18	Water supply, sewage, and waste treatment and disposal services	0.357	0.405	0.203	0.285
19	Construction	0.495	0.382	0.414	0.344
20	Wholesale and retail trade and commodity brokerage	0.498	0.483	0.404	0.433
21	Transportation	0.629	0.557	0.148	0.074
22	Food services and accommodation	0.243	0.474	0.338	0.358
23	Communications and broadcasting	0.446	0.518	0.574	0.515
24	Finance and insurance	0.303	0.480	0.329	0.463
25	Real estate services	0.470	0.460	0.272	0.394
26	Professional, scientific, and technical services	0.828	0.493	0.511	0.453
27	Public support services	0.369	0.473	0.322	0.401
28	Public administration, defense, and social security services	0.382	0.431	0.390	0.354
29	Education services	0.311	0.429	0.322	0.349
30	Health and social care services	0.637	0.492	0.346	0.361
31	Art, sports, and leisure services	0.451	0.474	0.457	0.430
32	Other services	0.656	0.469	0.459	0.383
33	Others	0.092	0.424	0.120	0.358
Mean		**0.424**	**0.409**	**0.382**	**0.381**

Note: $\hat{\delta}_j$ is from the regression (9), and δ_j is the value that minimizes the MAPE for the sectoral multipliers.
Source: The results are based on calculations performed by the authors.

Table A.12. Outcomes obtained through Kowalewski's industry-specific approach.

Sector	Description	Busan		Chungcheong-buk-do	
		δ_j	$\hat{\delta}_j$	δ_j	$\hat{\delta}_j$
1	Agricultural, forest, and fishery goods	0.396	0.442	0.257	0.170
2	Mined and quarried goods	0.792	0.532	0.004	0.104
3	Food, beverages, and tobacco products	0.176	0.353	0.011	0.139
4	Textile and leather products	0.224	0.243	0.475	0.428
5	Wood and paper products, printing and reproduction of recorded media	0.441	0.388	0.378	0.284
6	Petroleum and coal products	0.691	0.702	0.084	0.419
7	Chemical products	0.495	0.446	0.367	0.297
8	Non-metallic mineral products	0.514	0.444	0.080	0.140
9	Basic metal products	0.294	0.323	0.305	0.420
10	Fabricated metal products, except machinery and furniture	0.302	0.210	0.353	0.313
11	Computing machinery, electronic equipment, and optical instruments	0.479	0.547	0.402	0.240
12	Electrical equipment	0.436	0.373	0.425	0.203
13	Machinery and equipment	0.308	0.268	0.537	0.380
14	Transport equipment	0.414	0.370	0.672	0.379
15	Other manufactured products	0.413	0.378	0.262	0.288
16	Manufacturing services and repair services of industrial equipment	0.290	0.253	0.218	0.298
17	Electricity, gas, and steam supply	0.269	0.271	0.748	0.483
18	Water supply, sewage, and waste treatment and disposal services	0.248	0.226	0.196	0.292
19	Construction	0.310	0.236	0.438	0.367
20	Wholesale and retail trade and commodity brokerage	0.224	0.249	0.320	0.332
21	Transportation	0.113	0.000	0.307	0.431
22	Food services and accommodation	0.117	0.183	0.195	0.380
23	Communications and broadcasting	0.305	0.451	0.286	0.329
24	Finance and insurance	0.209	0.268	0.195	0.310
25	Real estate services	0.174	0.256	0.262	0.304
26	Professional, scientific, and technical services	0.317	0.346	0.587	0.340
27	Public support services	0.209	0.257	0.252	0.307
28	Public administration, defense, and social security services	0.335	0.254	0.210	0.297
29	Education services	0.179	0.208	0.194	0.313
30	Health and social care services	0.135	0.155	0.390	0.356
31	Art, sports, and leisure services	0.181	0.275	0.525	0.344
32	Other services	0.218	0.199	0.455	0.358
33	Others	0.106	0.219	0.068	0.410
Mean		**0.312**	**0.313**	**0.317**	**0.317**

Note: $\hat{\delta}_j$is from the regression (9), and $\delta_j$is the value that minimizes the MAPE for the sectoral multipliers.
Source: Authors' own calculations.

Table A.13. Outcomes obtained through Kowalewski's industry-specific approach.

Sector	Description	Daegu		Jeollabuk-do	
		δ_j	$\hat{\delta}_j$	δ_j	$\hat{\delta}_j$
1	Agricultural, forest, and fishery goods	0.617	0.476	0.000	0.052
2	Mined and quarried goods	1.000	0.495	0.000	0.172
3	Food, beverages, and tobacco products	0.324	0.314	0.039	0.071
4	Textile and leather products	0.152	0.201	0.317	0.335
5	Wood and paper products, printing, and reproduction of recorded media	0.270	0.206	0.301	0.203
6	Petroleum and coal products	0.000	0.662	0.086	0.356
7	Chemical products	0.374	0.356	0.336	0.252
8	Non-metallic mineral products	0.374	0.364	0.209	0.232
9	Basic metal products	0.413	0.415	0.330	0.267
10	Fabricated metal products, except machinery and furniture	0.275	0.143	0.407	0.322
11	Computing machinery, electronic equipment, and optical instruments	0.486	0.473	0.693	0.357
12	Electrical equipment	0.303	0.273	0.471	0.327
13	Machinery and equipment	0.265	0.221	0.309	0.301
14	Transport equipment	0.351	0.379	0.356	0.246
15	Other manufactured products	0.361	0.343	0.372	0.318
16	Manufacturing services and repair services of industrial equipment	0.203	0.165	0.223	0.262
17	Electricity, gas, and steam supply	0.300	0.329	0.211	0.230
18	Water supply, sewage and waste treatment and disposal services	0.170	0.154	0.179	0.207
19	Construction	0.259	0.140	0.218	0.225
20	Wholesale and retail trade and commodity brokerage	0.183	0.253	0.268	0.287
21	Transportation	0.267	0.275	0.260	0.260
22	Food services and accommodation	0.117	0.171	0.204	0.270
23	Communications and broadcasting	0.260	0.385	0.203	0.312
24	Finance and insurance	0.178	0.269	0.160	0.276
25	Real estate services	0.131	0.184	0.258	0.240
26	Professional, scientific, and technical services	0.330	0.322	0.000	0.320
27	Public support services	0.160	0.221	0.242	0.245
28	Public administration, defense, and social security services	0.195	0.137	0.176	0.141
29	Education services	0.107	0.111	0.103	0.169
30	Health and social care services	0.091	0.103	0.185	0.194
31	Art, sports, and leisure services	0.285	0.276	0.307	0.278
32	Other services	0.075	0.111	0.270	0.246
33	Others	0.082	0.183	0.071	0.332
Mean		**0.272**	**0.276**	**0.235**	**0.252**

Note: $\hat{\delta}_j$ is from the regression (9), and δ_j is the value that minimizes the MAPE for the sectoral multipliers.
Source: The results are based on calculations performed by the authors.

Table A.14. Outcomes obtained through Kowalewski's industry-specific approach.

Sector	Description	Gangwon-do		Gwangju	
		δ_j	$\hat{\delta}_j$	δ_j	$\hat{\delta}_j$
1	Agricultural, forest, and fishery goods	0.138	0.068	0.774	0.547
2	Mined and quarried goods	0.000	0.000	0.684	0.537
3	Food, beverages, and tobacco products	0.249	0.230	0.316	0.330
4	Textile and leather products	0.649	0.463	0.577	0.441
5	Wood and paper products, printing, and reproduction of recorded media	0.367	0.383	0.406	0.301
6	Petroleum and coal products	0.000	0.473	0.000	0.812
7	Chemical products	0.377	0.400	0.309	0.351
8	Non-metallic mineral products	0.000	0.074	0.445	0.404
9	Basic metal products	0.408	0.445	0.260	0.440
10	Fabricated metal products, except machinery and furniture	0.468	0.379	0.250	0.298
11	Computing machinery, electronic equipment, and optical instruments	0.533	0.424	0.473	0.543
12	Electrical equipment	0.436	0.384	0.264	0.143
13	Machinery and equipment	0.545	0.407	0.198	0.261
14	Transport equipment	0.376	0.455	0.337	0.236
15	Other manufactured products	0.251	0.387	0.355	0.397
16	Manufacturing services and repair services of industrial equipment	0.397	0.298	0.187	0.138
17	Electricity, gas, and steam supply	0.246	0.317	0.548	0.347
18	Water supply, sewage, and waste treatment and disposal services	0.150	0.191	0.154	0.148
19	Construction	0.062	0.146	0.285	0.134
20	Wholesale and retail trade and commodity brokerage	0.210	0.264	0.187	0.300
21	Transportation	0.170	0.286	0.009	0.259
22	Food services and accommodation	0.216	0.218	0.104	0.164
23	Communications and broadcasting	0.097	0.280	0.262	0.431
24	Finance and insurance	0.147	0.256	0.145	0.329
25	Real estate services	0.200	0.169	0.111	0.203
26	Professional, scientific, and technical services	0.413	0.315	0.387	0.353
27	Public support services	0.177	0.183	0.146	0.220
28	Public administration, defense, and social security services	0.000	0.000	0.291	0.123
29	Education services	0.136	0.097	0.081	0.083
30	Health and social care services	0.165	0.197	0.105	0.108
31	Art, sports, and leisure services	0.035	0.062	0.176	0.250
32	Other services	0.190	0.235	0.206	0.145
33	Others	0.000	0.260	0.104	0.175
Mean		**0.237**	**0.265**	**0.277**	**0.302**

Note: $\hat{\delta}_j$is from the regression (9), and $\delta_j$is the value that minimizes the MAPE for the sectoral multipliers.
Source: The results are based on calculations performed by the authors.

Table A.15. Outcomes obtained through Kowalewski's industry-specific approach.

Sector	Description	Daejeon		Jeju-do	
		$\boldsymbol{\delta_j}$	$\hat{\delta}_j$	$\boldsymbol{\delta_j}$	$\widehat{\boldsymbol{\delta}}_{\boldsymbol{j}}$
1	Agricultural, forest, and fishery goods	0.989	0.694	0.000	0.000
2	Mined and quarried goods	0.853	0.701	0.009	0.000
3	Food, beverages, and tobacco products	0.298	0.119	0.263	0.245
4	Textile and leather products	0.500	0.548	0.565	0.559
5	Wood and paper products, printing and reproduction of recorded media	0.380	0.157	0.363	0.475
6	Petroleum and coal products	0.000	0.839	1.000	0.694
7	Chemical products	0.347	0.369	0.369	0.540
8	Non-metallic mineral products	0.398	0.511	0.166	0.205
9	Basic metal products	0.713	0.588	1.000	0.587
10	Fabricated metal products, except machinery and furniture	0.345	0.439	0.441	0.480
11	Computing machinery, electronic equipment, and optical instruments	0.446	0.554	0.760	0.576
12	Electrical equipment	0.386	0.375	0.728	0.525
13	Machinery and equipment	0.330	0.345	0.743	0.515
14	Transport equipment	0.551	0.627	1.000	0.521
15	Other manufactured products	0.407	0.460	0.283	0.433
16	Manufacturing services and repair services of industrial equipment	0.548	0.406	0.608	0.447
17	Electricity, gas, and steam supply	0.436	0.419	0.391	0.467
18	Water supply, sewage, and waste treatment and disposal services	0.305	0.294	0.214	0.231
19	Construction	0.400	0.273	0.000	0.000
20	Wholesale and retail trade and commodity brokerage	0.242	0.362	0.127	0.192
21	Transportation	0.212	0.305	0.187	0.221
22	Food services and accommodation	0.304	0.215	0.092	0.000
23	Communications and broadcasting	0.330	0.496	0.141	0.187
24	Finance and insurance	0.219	0.372	0.187	0.286
25	Real estate services	0.200	0.283	0.177	0.238
26	Professional, scientific, and technical services	0.214	0.246	0.374	0.403
27	Public support services	0.193	0.228	0.070	0.043
28	Public administration, defense, and social security services	0.095	0.130	0.142	0.080
29	Education services	0.166	0.120	0.145	0.161
30	Health and social care services	0.187	0.132	0.149	0.195
31	Art, sports, and leisure services	0.285	0.340	0.000	0.000
32	Other services	0.176	0.200	0.154	0.189
33	Others	0.070	0.217	0.048	0.144
Mean		**0.349**	**0.375**	**0.330**	**0.295**

Note: $\hat{\delta}_j$is from the regression (9), and $\delta_j$is the value that minimizes the MAPE for the sectoral multipliers.
Source: The results are based on calculations performed by the authors.

Table A.16. Outcomes obtained through Kowalewski's industry-specific approach.

Sector	Description	Sejong	
		δ_j	$\hat{\delta}_j$
1	Agricultural, forest, and fishery goods	0.372	0.288
2	Mined and quarried goods	0.122	0.235
3	Food, beverages, and tobacco products	0.194	0.421
4	Textile and leather products	0.796	0.485
5	Wood and paper products, printing and reproduction of recorded media	0.424	0.307
6	Petroleum and coal products	0.116	0.256
7	Chemical products	0.274	0.386
8	Non-metallic mineral products	0.403	0.200
9	Basic metal products	0.701	0.455
10	Fabricated metal products, except machinery and furniture	0.572	0.470
11	Computing machinery, electronic equipment, and optical instruments	0.176	0.322
12	Electrical equipment	0.243	0.380
13	Machinery and equipment	0.666	0.491
14	Transport equipment	0.468	0.516
15	Other manufactured products	0.388	0.477
16	Manufacturing services and repair services of industrial equipment	0.221	0.392
17	Electricity, gas, and steam supply	0.332	0.277
18	Water supply, sewage, and waste treatment and disposal services	0.292	0.379
19	Construction	0.234	0.270
20	Wholesale and retail trade and commodity brokerage	0.444	0.378
21	Transportation	0.319	0.407
22	Food services and accommodation	0.270	0.476
23	Communications and broadcasting	0.272	0.336
24	Finance and insurance	0.364	0.337
25	Real estate services	0.370	0.257
26	Professional, scientific, and technical services	0.395	0.372
27	Public support services	0.362	0.291
28	Public administration, defense, and social security services	0.000	0.149
29	Education services	0.258	0.297
30	Health and social care services	0.474	0.388
31	Art, sports, and leisure services	0.456	0.378
32	Other services	0.395	0.445
33	Others	0.000	0.575
Mean		**0.345**	**0.366**

Note: $\hat{\delta}_j$ is from the regression (9), and δ_j is the value that minimizes the MAPE for the sectoral multipliers.
Source: The results are based on calculations performed by the authors.

Table A.17. MAPE estimates for South Korea regions in 2015.

	Region	Minimum MAPE FLQ	MAPE FLQ (δ=0.35)	Difference FLQ-minimum %	Minimum MAPE SFLQ	MAPE SFLQ double-log model (17)	Difference SFLQ-minimum %	Difference minimum MAPEs	MAPE SFLQ-MAPE FLQ
1	Gyeonggi	4.20	7.20	71.49	0.92	3.86	319.82	–3.28	–3.34
2	Seoul	9.15	9.15	0.01	5.91	6.74	14.11	–3.25	–2.41
3	Gyeongsangbuk-do	5.04	5.28	4.71	0.95	4.90	418.57	–4.09	–0.37
4	Gyeongsangnam-do	4.87	5.15	5.66	1.03	3.34	223.40	–3.84	–1.81
5	Ulsan	6.54	7.63	16.57	1.49	5.91	296.85	–5.05	–1.72
6	Jeollanam-do	8.36	8.39	0.26	2.03	4.96	144.21	–6.34	–3.43
7	Chungcheongnam-do	6.99	7.86	12.43	1.15	6.05	424.64	–5.83	–1.81
8	Incheon	4.69	5.26	12.22	0.75	3.07	307.81	–3.94	–2.19
9	Busan	5.90	6.57	11.42	1.18	4.00	239.26	–4.72	–2.57
10	Chungcheongbuk-do	6.70	6.79	1.32	1.26	7.45	489.62	–5.44	0.66
11	Daegu	7.14	8.16	14.19	2.18	4.51	106.48	–4.96	–3.65
12	Jeollabuk-do	6.72	7.45	10.90	1.90	5.78	204.98	–4.82	–1.66
13	Gangwon-do	8.85	9.22	4.14	2.60	5.15	98.21	–6.25	–4.07
14	Gwangju	8.12	8.80	8.41	1.55	5.13	231.36	–6.57	–3.68
15	Daejeon	7.79	7.89	1.23	1.57	4.87	209.64	–6.22	–3.02
16	Jeju-do	8.87	10.47	17.96	5.07	7.08	39.45	–3.80	–3.39
17	Sejong	6.88	7.54	9.57	1.48	6.54	340.83	–5.40	–1.00
Mean		**6.87**	**7.58**	**11.91**	**1.94**	**5.25**	**241.72**	**–4.93**	**–2.32**

Source: The results are based on calculations performed by the authors.

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