Part 2. Analyzing Environmental Policies with IGEM

Appendix E. Estimated parameters of IGEM; cost functions, import functions, investment functions.

November 30, 2008

E.1 IGEM industry cost functions
E.2 Cost functions; lower tier

Table E.1. Estimated parameters of industry cost function.

	1 Agriculture		2 Metal Mining		3 Coal Mining		4 Petroleum and Gas		5 Nonmetallic Mining		6 Construction		7 Food Products	
α_K	0.171	(0.377)	0.192	(0.008)	-0.001	(0.667)	-0.077	(0.023)	-0.161	(12.289)	0.060	(0.850)	-0.057	(0.028)
α_L	0.166	(1.106)	0.754	(0.040)	0.018	(1.572)	0.058	(0.007)	0.064	(8.921)	0.127	(2.843)	0.276	(0.016)
α_E	0.050	(0.232)	0.054	(0.008)	-0.259	(0.777)	-0.016	(0.036)	0.045	(14.865)	0.041	(1.432)	0.005	(0.001)
α_0	0.266	(1.740)	-0.620	(0.529)	0.098	(1.033)	-0.177	(0.118)	-0.046	(28.214)	-0.093	(0.822)	0.101	(0.101)
β_{KK}	0.113	(0.425)	0.057	(0.006)	0.087	(2.974)	0.005	(0.080)	0.008	(19.347)	0.037	(0.076)	0.036	(0.060)
β_{KL}	-0.039	(0.408)	0.020	(0.053)	-0.058	(1.226)	-0.017	(0.026)	0.008	(12.750)	-0.004	(0.185)	-0.002	(0.027)
β_{KE}	-0.002	(0.277)	-0.036	(0.025)	-0.027	(4.320)	0.021	(0.018)	0.015	(10.008)	0.000	(0.013)	-0.001	(0.008)
β_{LL}	0.036	(3.377)	-0.290	(0.032)	-0.299	(5.560)	-0.042	(0.241)	-0.021	(50.094)	-0.137	(1.028)	-0.045	(0.017)
β_{LE}	-0.026	(0.444)	0.012	(0.056)	0.130	(3.858)	-0.014	(0.049)	-0.053	(4.590)	-0.016	(0.051)	0.004	(0.022)
β_{EE}	-0.004	(0.024)	0.037	(0.072)	0.019	(1.235)	0.012	(0.173)	0.052	(36.944)	0.007	(0.025)	0.010	(0.000)
χ_K	0.025	(0.083)	0.081	(0.084)	0.067	(0.082)	0.056	(0.152)	0.058	(45.136)	-0.025	(0.198)	0.070	(0.034)
χ_L	0.015	(0.447)	-0.242	(0.084)	0.100	(0.074)	-0.029	(0.002)	0.109	(189.898)	0.114	(1.088)	-0.092	(0.022)
χ_E	0.008	(0.514)	0.018	(0.005)	0.079	(0.022)	0.136	(0.045)	0.025	(27.769)	-0.004	(0.426)	0.012	(0.017)
χ_p	-0.027	(1.275)	-0.073	(0.010)	-0.114	(0.029)	-0.100	(0.077)	-0.058	(425.450)	-0.034	(0.621)	-0.020	(0.036)
δ_{KK}	0.247	(1.006)	0.447	(0.161)	0.922	(0.003)	0.875	(0.278)	0.833	(73.238)	0.690	(0.195)	0.724	(0.229)
δ_{KL}	0.097	(0.947)	0.116	(0.156)	-0.048	(0.003)	0.261	(0.139)	0.089	(93.385)	0.085	(3.580)	0.166	(0.111)
δ_{KE}	0.262	(2.182)	0.002	(0.001)	-0.067	(0.007)	-0.045	(0.109)	-0.071	(89.185)	-0.104	(4.318)	-0.607	(0.096)
δ_{Kp}	0.069	(3.252)	-0.057	(0.057)	-0.038	(0.046)	-0.063	(0.169)	0.067	(132.420)	0.218	(4.097)	0.151	(2.205)
δ_{LK}	-0.158	(5.267)	0.779	(0.338)	-0.060	(0.076)	0.136	(0.006)	-0.120	(416.552)	0.075	(0.392)	0.314	(0.147)
δ_{LL}	0.835	(1.127)	0.558	(0.170)	0.850	(0.010)	0.491	(0.007)	0.718	(46.211)	0.557	(0.192)	0.682	(0.057)
δ_{LE}	0.273	(9.924)	-0.325	(3.385)	-0.082	(0.020)	0.019	(0.003)	0.200	(192.076)	-0.130	(0.284)	0.990	(0.619)
δ_{Lp}	0.000	(3.120)	0.048	(0.078)	0.005	(0.007)	-0.013	(0.092)	-0.306	(119.556)	-0.198	(0.994)	0.022	(0.180)
δ_{EK}	-0.137	(14.152)	-0.059	(0.013)	-0.083	(0.050)	-0.722	(0.011)	-0.038	(77.646)	0.194	(0.385)	-0.040	(0.050)
δ_{EL}	-0.005	(3.871)	0.010	(0.042)	-0.018	(0.044)	3.202	(0.022)	0.002	(32.789)	-0.019	(0.361)	0.034	(0.074)
δ_{EE}	1.064	(7.100)	0.658	(0.233)	0.874	(0.020)	0.803	(0.008)	0.863	(71.712)	0.588	(1.336)	0.816	(0.070)
δ_{Ep}	0.057	(4.314)	0.007	(0.037)	0.143	(0.052)	0.042	(0.038)	0.237	(331.649)	0.072	(1.087)	-0.015	(0.105)
δ_{pK}	0.134	(40.125)	0.432	(0.608)	0.134	(0.033)	0.197	(0.022)	0.113	(941.232)	-0.099	(0.563)	0.083	(0.198)
δ_{pL}	0.057	(6.102)	-0.129	(0.152)	0.332	(0.132)	0.873	(0.080)	0.045	(27.414)	0.133	(0.281)	0.004	(0.097)
δ_{pE}	-0.457	(12.978)	-0.119	(1.439)	-0.109	(0.062)	-0.249	(0.017)	-0.002	(334.707)	-0.170	(0.969)	0.023	(0.359)
δ_{pp}	0.191	(2.910)	0.085	(0.186)	0.672	(0.059)	0.709	(0.187)	-0.028	(687.852)	0.311	(0.624)	-0.276	(0.838)

Standard errors in parenthesis

Table E.1 (cont). Estimated parameters of industry cost function.

	8 Tobacco Products		9 Textile Mill Products		10 Apparel and Textiles		11 Lumber and Wood		12 Furniture and Fixtures		13 Paper Products		14 Printing and Publishing	
α_K	0.063	(0.030)	0.064	(0.005)	-0.020	(0.006)	-0.015	(0.012)	0.071	(0.007)	-0.052	(0.054)	0.021	(0.057)
α_L	0.029	(0.110)	0.141	(0.009)	0.000	(0.000)	0.053	(0.242)	0.367	(0.018)	-0.003	(0.005)	0.394	(0.019)
α_E	0.021	(0.001)	0.065	(0.043)	-0.001	(0.003)	-0.036	(0.035)	0.049	(0.000)	0.005	(0.072)	0.046	(0.000)
α_0	-0.318	(0.520)	0.364	(0.040)	-0.324	(1.636)	0.138	(0.197)	0.046	(1.103)	0.110	(0.321)	-0.041	(0.027)
β_{KK}	0.086	(0.003)	0.011	(0.249)	0.014	(0.012)	0.016	(0.042)	0.047	(0.007)	0.025	(0.100)	-0.056	(0.089)
β_{KL}	-0.030	(0.062)	0.078	(0.081)	-0.017	(0.023)	0.012	(0.132)	-0.027	(0.002)	-0.006	(0.018)	0.020	(0.044)
β_{KE}	0.000	(0.004)	0.001	(0.069)	0.001	(0.007)	-0.002	(0.004)	-0.002	(0.001)	0.008	(0.019)	0.000	(0.001)
β_{LL}	-0.049	(0.029)	-0.010	(0.016)	0.062	(0.010)	-0.001	(0.474)	0.056	(0.028)	0.013	(0.024)	0.087	(0.006)
β_{LE}	0.001	(0.005)	-0.017	(0.045)	0.003	(0.028)	-0.020	(0.087)	-0.003	(0.009)	0.000	(0.064)	-0.004	(0.011)
β_{EE}	0.002	(0.001)	0.014	(0.169)	0.007	(0.009)	0.008	(0.005)	0.011	(0.003)	0.032	(0.004)	0.007	(0.005)
χ_K	0.032	(0.127)	0.022	(0.037)	0.027	(0.010)	0.015	(0.325)	0.008	(0.187)	0.065	(1.208)	0.054	(0.002)
χ_L	0.027	(0.126)	0.023	(0.170)	0.047	(0.225)	0.047	(0.040)	0.032	(0.262)	0.022	(1.193)	-0.136	(0.042)
χ_E	-0.007	(0.006)	-0.011	(0.082)	-0.005	(0.026)	0.028	(0.069)	-0.009	(0.015)	0.053	(0.355)	-0.027	(0.048)
χ_p	-0.012	(0.251)	-0.026	(0.140)	-0.042	(0.288)	-0.080	(0.172)	0.011	(0.065)	-0.100	(7.518)	0.023	(0.164)
δ_{KK}	0.331	(2.937)	0.533	(1.478)	0.844	(0.041)	0.798	(0.519)	0.614	(2.996)	0.691	(6.048)	0.471	(0.218)
δ_{KL}	0.851	(4.070)	-0.135	(0.483)	-0.035	(0.007)	-0.004	(0.744)	0.048	(1.783)	-0.003	(1.041)	0.003	(0.183)
δ_{KE}	0.958	(9.272)	-0.029	(2.889)	-0.056	(0.557)	0.202	(2.006)	-0.030	(4.278)	-0.138	(8.392)	-0.334	(0.058)
δ_{Kp}	-0.028	(0.564)	-0.016	(1.104)	-0.011	(0.018)	-0.075	(0.707)	0.027	(0.686)	0.009	(0.385)	-0.778	(0.829)
δ_{LK}	-0.204	(0.444)	-0.174	(0.376)	-0.093	(1.127)	0.046	(0.218)	-0.036	(4.586)	0.111	(3.092)	0.474	(0.126)
δ_{LL}	1.189	(0.564)	0.804	(0.596)	0.864	(0.642)	0.785	(0.273)	0.738	(2.623)	0.878	(1.111)	0.914	(0.022)
δ_{LE}	0.815	(9.907)	0.022	(3.116)	0.248	(5.491)	-0.195	(0.880)	1.028	(5.812)	-0.246	(8.125)	-2.173	(0.019)
δ_{Lp}	0.006	(0.364)	-0.122	(0.178)	-0.008	(0.061)	-0.066	(0.320)	-0.003	(0.284)	0.092	(0.827)	1.203	(0.189)
δ_{EK}	-0.062	(0.066)	0.092	(0.641)	0.024	(0.123)	0.059	(0.026)	0.025	(0.214)	-0.230	(1.342)	0.097	(0.160)
δ_{EL}	0.075	(0.096)	0.071	(0.699)	0.011	(0.051)	-0.086	(0.048)	-0.011	(0.144)	0.051	(0.118)	0.006	(0.044)
δ_{EE}	0.342	(0.406)	0.902	(0.086)	0.919	(0.126)	0.704	(0.799)	0.752	(0.335)	0.423	(2.694)	0.585	(0.684)
δ_{Ep}	0.002	(0.034)	0.048	(0.354)	0.001	(0.004)	-0.043	(0.116)	0.007	(0.009)	0.035	(0.092)	0.158	(0.215)
δ_{pK}	-0.015	(3.874)	0.083	(0.546)	0.151	(1.417)	-0.094	(0.430)	-0.116	(2.642)	0.540	(27.190)	-0.008	(0.447)
δ_{pL}	0.233	(4.527)	0.054	(1.203)	0.078	(0.529)	0.323	(1.385)	-0.063	(0.854)	-0.078	(2.381)	-0.069	(0.082)
δ_{pE}	0.030	(25.983)	-0.154	(1.219)	-0.447	(0.262)	0.460	(0.154)	0.518	(0.138)	0.371	(43.427)	0.562	(3.184)
δ_{pp}	0.169	(6.058)	0.104	(1.653)	0.011	(0.053)	0.437	(0.991)	-0.135	(0.967)	-0.073	(1.257)	0.850	(0.763)

Table E.1 (cont). Estimated parameters of industry cost function.

	15 Chemical Products		16 Petroleum Refining		17 Rubber and Plastic		18 Leather Products		19 Stone, Clay, and Glass		20 Primary Metals		21 Fabricated Metals	
α_K	0.151	(0.003)	0.015	(0.014)	-0.046	(0.009)	0.029	(0.028)	0.091	(0.484)	0.076	(0.017)	0.049	(0.061)
α_L	0.061	(0.005)	0.016	(0.009)	0.042	(0.010)	0.319	(0.002)	0.516	(0.363)	0.089	(0.016)	0.021	(0.041)
α_E	-0.010	(0.002)	0.018	(0.033)	0.037	(0.013)	0.024	(0.002)	0.130	(0.209)	0.103	(0.004)	-0.017	(0.004)
α_0	-0.045	(0.051)	0.170	(0.109)	-0.113	(0.058)	0.083	(0.057)	0.062	(0.268)	0.050	(0.140)	0.116	(0.089)
β_{KK}	0.064	(0.009)	0.033	(0.031)	0.027	(0.005)	0.006	(0.162)	0.054	(0.169)	0.057	(0.058)	0.047	(0.048)
β_{KL}	-0.012	(0.032)	0.011	(0.003)	-0.032	(0.012)	-0.040	(0.199)	-0.046	(0.253)	-0.021	(0.064)	-0.019	(0.073)
β_{KE}	-0.033	(0.054)	-0.049	(0.018)	0.000	(0.009)	-0.002	(0.010)	-0.004	(0.003)	-0.008	(0.003)	-0.001	(0.004)
β_{LL}	-0.202	(0.078)	-0.009	(0.001)	-0.001	(0.069)	-0.077	(0.190)	0.104	(0.709)	0.056	(0.073)	0.042	(0.041)
β_{LE}	0.008	(0.004)	-0.035	(0.003)	-0.019	(0.001)	-0.006	(0.026)	-0.039	(0.356)	-0.051	(0.026)	-0.008	(0.057)
β_{EE}	0.034	(0.014)	0.116	(0.007)	0.018	(0.026)	0.011	(0.049)	0.041	(0.084)	0.003	(0.142)	0.011	(0.017)
χ_K	-0.037	(0.017)	0.149	(0.087)	-0.018	(0.002)	0.018	(0.052)	0.014	(0.156)	0.138	(0.209)	0.005	(0.011)
χ_L	-0.004	(0.328)	0.003	(0.001)	0.090	(0.002)	-0.004	(0.201)	-0.023	(0.674)	0.026	(0.222)	0.097	(0.010)
χ_E	0.043	(0.061)	0.225	(0.043)	0.015	(0.029)	-0.002	(0.007)	-0.006	(0.209)	0.048	(0.123)	-0.018	(0.005)
χ_P	-0.046	(0.480)	-0.026	(0.394)	-0.008	(0.209)	-0.002	(0.076)	0.015	(1.113)	-0.103	(0.066)	-0.026	(0.031)
δ_{KK}	0.761	(0.357)	-0.256	(0.047)	0.868	(0.898)	0.761	(1.055)	0.964	(2.959)	-0.828	(1.475)	0.875	(0.008)
δ_{KL}	0.339	(0.289)	-1.937	(0.306)	0.131	(0.403)	-0.098	(0.923)	0.033	(1.798)	-0.527	(1.155)	-0.033	(0.017)
δ_{KE}	-0.038	(0.181)	0.068	(0.174)	-0.034	(2.132)	0.509	(4.193)	0.099	(0.515)	0.947	(0.925)	0.406	(0.053)
δ_{Kp}	0.095	(0.040)	0.453	(0.070)	0.014	(0.053)	0.191	(3.727)	-0.047	(0.304)	0.028	(0.059)	0.009	(0.004)
δ_{LK}	0.024	(0.700)	0.160	(0.005)	0.008	(0.269)	-0.041	(3.284)	-0.045	(2.645)	0.578	(1.866)	-0.043	(0.002)
δ_{LL}	0.945	(0.387)	0.962	(0.039)	0.692	(0.128)	0.853	(1.605)	0.883	(3.191)	0.460	(1.133)	0.850	(0.001)
δ_{LE}	0.214	(3.349)	-0.022	(0.006)	0.216	(0.644)	-1.110	(9.322)	-0.060	(3.403)	-0.604	(1.137)	-1.297	(0.008)
δ_{Lp}	0.073	(0.093)	-0.126	(0.077)	-0.016	(0.034)	-0.148	(4.781)	-0.052	(0.307)	-0.083	(0.079)	0.133	(0.006)
δ_{EK}	-0.022	(0.383)	0.199	(0.109)	0.002	(0.110)	0.047	(0.059)	-0.064	(1.153)	-0.358	(1.093)	0.060	(0.001)
δ_{EL}	-0.106	(0.442)	-0.478	(0.129)	-0.056	(0.169)	0.031	(0.004)	-0.002	(1.143)	-0.334	(0.642)	0.046	(0.007)
δ_{EE}	0.635	(0.123)	0.663	(0.092)	0.929	(0.165)	0.790	(0.978)	0.866	(1.026)	1.034	(0.573)	0.998	(0.018)
δ_{Ep}	0.002	(0.132)	-0.310	(0.061)	0.000	(0.019)	0.058	(0.230)	0.067	(0.521)	-0.009	(0.011)	0.035	(0.001)
δ_{pK}	0.359	(1.177)	0.125	(0.642)	-0.045	(0.277)	-0.023	(1.114)	-0.225	(5.676)	0.559	(1.194)	0.059	(0.036)
δ_{pL}	-0.059	(0.440)	0.236	(0.773)	0.019	(0.889)	-0.028	(0.342)	0.013	(7.232)	0.571	(0.819)	0.044	(0.037)
δ_{pE}	0.467	(5.084)	0.013	(0.628)	-0.153	(0.988)	0.472	(7.042)	0.152	(4.820)	-0.553	(0.008)	0.105	(0.057)
δ_{pp}	0.137	(0.108)	0.130	(0.285)	-0.079	(0.231)	-0.308	(2.146)	-0.158	(4.131)	0.197	(0.164)	0.125	(0.001)

Table E.1 (cont). Estimated parameters of industry cost function.

	22 Industrial Machinery & Equip		23 Electronic & Electric Equipment		24 Motor Vehicles		25 Other Transportation Equip		26 Instruments		27 Miscellaneous Manufacturing		28 Transport and Warehouse	
α_K	0.009	(0.011)	0.046	(0.096)	-0.026	(0.002)	-0.038	(0.073)	0.076	(0.014)	0.052	(0.360)	-0.018	(0.006)
α_L	0.018	(0.015)	0.113	(0.045)	0.170	(0.009)	-0.013	(0.004)	-0.096	(0.106)	0.383	(0.598)	0.182	(0.053)
α_E	0.005	(0.001)	-0.003	(0.001)	0.033	(0.001)	-0.028	(0.007)	-0.004	(0.001)	0.000	(0.056)	0.048	(0.045)
α_0	0.099	(0.109)	0.632	(0.427)	0.034	(0.003)	0.057	(0.383)	0.230	(0.024)	0.200	(2.659)	0.257	(0.043)
β_{KK}	0.022	(0.003)	0.006	(0.003)	0.010	(0.013)	0.020	(0.255)	0.021	(0.011)	0.038	(0.937)	0.045	(0.013)
β_{KL}	-0.009	(0.002)	-0.023	(0.015)	-0.026	(0.022)	0.032	(0.125)	-0.006	(0.038)	0.026	(0.627)	-0.039	(0.152)
β_{KE}	0.000	(0.000)	-0.009	(0.003)	-0.001	(0.001)	0.000	(0.002)	-0.002	(0.002)	-0.005	(0.534)	-0.022	(0.088)
β_{LL}	-0.007	(0.023)	0.034	(0.064)	-0.042	(0.031)	0.006	(0.135)	0.102	(0.171)	0.000	(1.448)	-0.091	(0.002)
β_{LE}	-0.006	(0.000)	-0.008	(0.005)	-0.005	(0.010)	-0.001	(0.002)	-0.009	(0.005)	0.001	(0.299)	0.004	(0.127)
β_{EE}	0.007	(0.001)	0.008	(0.008)	0.004	(0.007)	0.006	(0.021)	0.007	(0.006)	0.010	(0.408)	0.044	(0.032)
χ_K	0.023	(0.009)	0.219	(0.013)	-0.013	(0.114)	-0.005	(0.149)	0.057	(0.077)	-0.005	(0.051)	0.143	(0.120)
χ_L	0.036	(0.043)	0.093	(0.020)	0.033	(0.173)	0.088	(0.288)	-0.048	(0.111)	0.011	(0.342)	-0.018	(0.024)
χ_E	0.004	(0.003)	0.304	(0.046)	-0.003	(0.001)	-0.003	(0.092)	0.002	(0.001)	0.005	(0.344)	-0.006	(0.058)
χ_p	-0.258	(0.011)	-0.179	(0.688)	-0.011	(0.256)	-0.173	(1.260)	-0.120	(0.073)	-0.037	(3.953)	0.156	(0.021)
δ_{KK}	0.921	(0.051)	0.271	(0.016)	1.174	(0.891)	0.925	(0.199)	0.576	(0.286)	0.956	(4.825)	0.364	(0.381)
δ_{KL}	-0.043	(0.009)	-0.679	(0.377)	0.402	(0.470)	0.037	(0.501)	-0.070	(0.117)	-0.021	(3.213)	-0.217	(0.262)
δ_{KE}	-0.075	(0.098)	-0.074	(0.077)	-0.102	(1.394)	-0.075	(2.495)	-0.563	(0.422)	0.556	(12.261)	0.299	(0.115)
δ_{Kp}	0.021	(0.005)	-0.006	(0.019)	0.277	(0.523)	0.135	(0.495)	0.004	(0.242)	-0.019	(2.804)	-0.127	(0.291)
δ_{LK}	0.089	(0.439)	-0.300	(0.100)	-0.321	(0.903)	-0.463	(0.006)	0.290	(0.375)	-0.689	(13.311)	0.061	(0.009)
δ_{LL}	0.875	(0.031)	0.678	(0.087)	0.399	(0.407)	0.890	(1.344)	1.021	(0.162)	0.649	(5.449)	0.970	(0.040)
δ_{LE}	-0.532	(0.530)	0.157	(0.207)	0.479	(3.881)	0.242	(7.347)	1.797	(0.656)	0.833	(24.106)	0.326	(0.002)
δ_{Lp}	0.005	(0.005)	-0.011	(0.049)	-0.271	(0.043)	-0.121	(2.424)	-0.074	(0.423)	-0.166	(0.674)	-0.106	(0.019)
δ_{EK}	-0.158	(0.032)	-0.870	(0.112)	-0.032	(0.035)	0.043	(0.382)	0.007	(0.006)	0.007	(4.289)	0.054	(0.136)
δ_{EL}	0.045	(0.000)	-0.873	(0.057)	-0.062	(0.063)	0.018	(0.181)	-0.002	(0.000)	0.011	(2.376)	0.028	(0.127)
δ_{EE}	0.717	(0.040)	-0.872	(0.408)	0.763	(0.156)	0.765	(0.681)	0.964	(0.073)	0.703	(10.947)	0.592	(0.001)
δ_{Ep}	0.001	(0.001)	0.023	(0.075)	0.038	(0.051)	-0.004	(0.181)	0.004	(0.008)	0.012	(1.176)	-0.537	(0.069)
δ_{pK}	2.497	(1.326)	0.108	(2.698)	0.044	(1.397)	0.014	(4.953)	0.432	(0.373)	0.262	(67.819)	-0.872	(0.028)
δ_{pL}	-0.087	(0.434)	0.550	(2.189)	-0.053	(0.485)	0.413	(2.843)	0.173	(0.164)	0.186	(33.557)	-0.178	(0.043)
δ_{pE}	0.704	(0.609)	-0.227	(2.691)	-0.160	(5.697)	-0.190	(13.363)	0.333	(2.107)	1.325	(76.643)	0.489	(0.066)
δ_{pp}	0.140	(0.137)	-0.479	(0.500)	0.392	(0.088)	-0.363	(11.726)	0.334	(0.533)	-0.053	(18.288)	-0.609	(0.108)

Table E.1 (cont). Estimated parameters of industry cost function.

	29 Communications		30 Electric Utilities		31 Gas Utilities		32 Trade		33 Finance, Insurance, and Real Estate		34 Services		35 Government Enterprises	
α_K	0.085	(0.114)	0.241	(0.015)	-0.255	(0.058)	0.112	(0.047)	0.428	(0.017)	0.025	(0.006)	0.157	(0.025)
α_L	0.355	(0.083)	0.064	(0.000)	0.112	(0.044)	0.668	(0.011)	0.121	(0.011)	0.075	(0.029)	0.591	(0.004)
α_E	0.079	(0.003)	0.013	(0.030)	0.111	(0.134)	-0.015	(0.017)	-0.005	(0.001)	-0.017	(0.003)	-0.003	(0.002)
α_0	0.218	(0.086)	0.088	(0.035)	0.041	(0.200)	0.169	(0.001)	0.161	(0.054)	-0.031	(0.010)	0.013	(0.016)
β_{KK}	-0.021	(0.457)	0.051	(0.051)	0.001	(0.075)	-0.037	(0.037)	-0.128	(0.136)	-0.069	(0.014)	0.108	(0.031)
β_{KL}	0.050	(0.247)	0.013	(0.097)	-0.028	(0.060)	0.012	(0.095)	0.076	(0.027)	-0.123	(0.022)	-0.046	(0.040)
β_{KE}	-0.003	(0.033)	-0.024	(0.001)	0.054	(0.159)	-0.007	(0.041)	-0.011	(0.007)	0.017	(0.003)	-0.018	(0.004)
β_{LL}	-0.097	(0.209)	0.000	(0.001)	-0.025	(0.003)	-0.095	(0.591)	-0.059	(0.072)	-0.041	(0.017)	-0.042	(0.008)
β_{LE}	-0.005	(0.004)	-0.019	(0.010)	0.011	(0.068)	0.009	(0.059)	0.003	(0.005)	0.008	(0.001)	-0.022	(0.004)
β_{EE}	0.002	(0.003)	0.062	(0.024)	-0.108	(0.294)	0.020	(0.174)	0.006	(0.011)	0.009	(0.001)	0.021	(0.001)
χ_K	0.070	(0.263)	-0.019	(0.248)	0.168	(0.073)	0.011	(0.000)	-0.025	(0.071)	0.249	(0.149)	0.063	(0.033)
χ_L	0.040	(0.396)	0.006	(0.156)	0.093	(0.083)	-0.023	(0.012)	0.029	(0.002)	0.167	(0.063)	0.135	(0.005)
χ_E	-0.025	(0.020)	0.025	(0.058)	0.040	(0.115)	0.006	(0.009)	0.001	(0.005)	-0.085	(0.070)	0.039	(0.012)
χ_p	-0.036	(0.858)	0.011	(0.163)	-0.405	(0.338)	0.008	(0.027)	-0.002	(0.065)	-0.133	(0.050)	-0.020	(0.050)
δ_{KK}	0.907	(2.451)	0.910	(0.666)	0.777	(0.033)	0.898	(0.019)	0.726	(0.105)	0.578	(0.163)	1.071	(0.025)
δ_{KL}	0.005	(4.350)	0.390	(0.393)	-0.238	(0.118)	0.040	(0.013)	0.357	(0.524)	-0.585	(0.420)	0.172	(0.125)
δ_{KE}	0.673	(1.991)	-0.073	(0.477)	-0.147	(0.113)	-0.007	(0.009)	-0.702	(0.872)	0.840	(0.322)	-0.596	(0.187)
δ_{Kp}	0.193	(0.346)	-0.057	(0.417)	0.016	(0.343)	-0.063	(0.003)	0.076	(0.196)	-0.194	(0.007)	-0.140	(0.045)
δ_{LK}	-0.125	(1.004)	0.035	(0.323)	-0.061	(0.127)	0.143	(0.000)	0.035	(0.197)	-0.035	(0.036)	0.775	(0.108)
δ_{LL}	0.721	(2.246)	0.865	(0.412)	0.755	(0.270)	0.885	(0.000)	0.758	(0.102)	0.541	(0.163)	1.025	(0.070)
δ_{LE}	0.514	(5.529)	0.030	(0.259)	-0.132	(0.073)	-0.096	(0.009)	-0.295	(0.639)	0.710	(0.063)	-3.574	(0.198)
δ_{Lp}	0.001	(0.119)	0.147	(0.028)	0.058	(0.132)	0.058	(0.004)	-0.225	(0.136)	0.054	(0.044)	0.165	(0.155)
δ_{EK}	0.001	(0.004)	0.006	(0.006)	-0.132	(0.242)	0.267	(0.006)	-0.039	(0.003)	-0.024	(0.004)	0.152	(0.005)
δ_{EL}	0.018	(0.040)	-0.279	(0.425)	0.371	(0.425)	0.013	(0.021)	0.050	(0.034)	0.298	(0.150)	0.062	(0.029)
δ_{EE}	0.627	(0.271)	1.033	(0.012)	1.044	(0.035)	0.734	(0.002)	0.620	(0.113)	-0.013	(0.204)	0.285	(0.112)
δ_{Ep}	-0.015	(0.042)	-0.248	(0.288)	-0.152	(0.660)	-0.027	(0.010)	-0.019	(0.001)	0.033	(0.014)	-0.020	(0.005)
δ_{pK}	0.085	(1.064)	-0.042	(0.069)	0.348	(0.152)	-0.320	(0.057)	-0.019	(0.434)	0.136	(0.297)	0.168	(0.078)
δ_{pL}	0.059	(1.459)	-0.101	(0.957)	0.596	(1.025)	0.036	(0.069)	-0.039	(0.675)	0.300	(0.287)	-0.153	(0.114)
δ_{pE}	-0.230	(11.335)	0.036	(0.245)	0.506	(0.235)	-0.064	(0.002)	0.000	(0.148)	-0.017	(1.198)	-0.457	(0.564)
δ_{pp}	0.405	(0.104)	0.708	(0.851)	0.022	(0.969)	-0.568	(0.049)	0.070	(0.813)	0.190	(0.033)	0.552	(0.144)

Table E2. Estimated parameters of cost functions of lower tiers
    Example for Agriculture (industry 1)

node		input	alpha	beta1	beta2	beta3	beta4	beta5
1	Gross output							
2	Energy	Coal mining	0.000	0.000	0.000	0.000	0.000	0.000
		Petro & Gas mining	0.000	0.000	0.000	0.000	0.000	0.000
		Refining	-0.127	0.000	0.000	0.093	-0.093	0.000
		Electric Utilities	1.127	0.000	0.000	-0.093	0.093	0.000
		Gas Utilities	0.000	0.000	0.000	0.000	0.000	0.000
3	Materials	Construction	0.000	0.000	0.000	0.000	0.000	0.000
		Agri Materials	-0.002	0.000	0.154	0.000	-0.033	-0.121
		Metallic Mat.	0.000	0.000	0.000	0.000	0.000	0.000
		Nonmetallic Mat.	-0.130	0.000	-0.033	0.000	0.018	0.015
		Services Mat.	1.132	0.000	-0.121	0.000	0.015	0.106
4	Agri	Agriculture	1.386	-0.344	0.344	0.000	0.000	0.000
	Materials	Food mfg	-0.386	0.344	-0.344	0.000	0.000	0.000
		Tobacco	0.000	0.000	0.000	0.000	0.000	0.000
		Textile-apparel	0.000	0.000	0.000	0.000	0.000	0.000
		Wood-paper	0.000	0.000	0.000	0.000	0.000	0.000
5	Metallic	Fab-other	-0.049	-0.017	-0.025	0.042		
	Materials	Machinery Mat.	-0.187	-0.025	0.103	-0.077		
		Equipment	1.235	0.042	-0.077	0.035		
6	Nonmetallic	Nonmetal mining	0.000	0.000	0.000	0.000	0.000	0.000
	Materials	Chemicals	1.000	0.000	0.000	0.000	0.000	0.000
		Rubber	0.000	0.000	0.000	0.000	0.000	0.000
		Stone,Clay,Glass	0.000	0.000	0.000	0.000	0.000	0.000
		Misc. mfg	0.000	0.000	0.000	0.000	0.000	0.000
7	Services	Transportation	-0.057	-0.002	0.070	0.057	-0.125	0.000
	Materials	Trade	-0.027	0.070	-0.009	-0.114	0.052	0.000
		FIRE	-0.015	0.057	-0.114	-0.080	0.137	0.000
		Services	1.099	-0.125	0.052	0.137	-0.065	0.000
		Other Services	0.000	0.000	0.000	0.000	0.000	0.000
8	Textile-	Textiles	0.123	-0.011	0.011	0.000		
	apparel	Apparel	0.877	0.011	-0.011	0.000		
		Leather	0.000	0.000	0.000	0.000		
9	Wood-	Lumber	-0.045	0.158	0.000	-0.158	0.000	
	paper	Furniture	0.000	0.000	0.000	0.000	0.000	
		Paper	1.045	-0.158	0.000	0.158	0.000	
		Printing	0.000	0.000	0.000	0.000	0.000	
10	Other	Communications	1.632	-0.051	0.051	0.000		
	Services	Govt. Enterp	-0.632	0.051	-0.051	0.000		
		Noncomp imports	0.000	0.000	0.000	0.000		
11	Fab-other	Metal Mining	0.000	0.000	0.000	0.000		
		Primary metals	0.017	0.000	0.064	-0.064		
		Fabricated metals	0.983	0.000	-0.064	0.064		
12	Machinery	Ind. Machinery	0.795	-0.105	0.105			
	Materials	Elect. Machinery	0.205	0.105	-0.105			
13	Equipment	Motor vehicles	0.401	-0.131	-0.169	0.300		
		Other Transp Eq	-0.137	-0.169	-0.219	0.388		
		Instruments	0.736	0.300	0.388	-0.687		

Table E3. Change in input bias terms for subtiers (1960-2005).

node	Components of node	1 Agriculture	2 Metal mng	3 Coal Mining	4 Petroleum	5 Nonmetal m	6 Construction	7 Food Mfg
2 E	Energy							
	coal	0.000	0.000	-0.253	0.000	0.000	0.000	0.000
	oil mining	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	refining	0.039	0.247	0.237	0.000	0.232	-0.008	0.154
	electric utilities	-0.039	-0.151	0.015	0.000	-0.086	0.008	0.079
	gas utilities	0.000	-0.096	0.000	0.000	-0.146	0.000	-0.233
3 M	Materials							
	construction	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Agriculture Mat.	-0.056	0.000	0.000	0.000	0.000	0.016	-0.023
	Metallic Mat.	0.000	0.048	-0.015	-0.085	-0.019	-0.046	0.000
	Nonmetallic Mat.	0.016	-0.018	-0.014	-0.003	0.007	-0.006	0.000
	Services Mat.	0.041	-0.030	0.029	0.088	0.011	0.036	0.023
4 MA	Agriculture Materials							
	agriculture	-0.050	0.145	0.065	0.139	0.000	0.000	0.037
	food	0.050	0.000	0.000	0.000	0.000	0.000	-0.033
	tobacco	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Textile-Apparel	0.000	0.000	0.301	0.000	0.000	0.000	0.000
	Wood-Paper	0.000	-0.145	-0.366	-0.139	0.000	0.000	-0.004
5 MM	Metallic Materials							
	Fab-Other Metals	-0.016	0.080	-0.118	0.009	-0.156	-0.044	0.000
	Machinery	-0.032	-0.080	0.118	-0.009	0.156	0.044	0.000
	Equipment	0.048	0.000	0.000	0.000	0.000	0.000	0.000
6 MN	NonMetallic Materials							
	nonmetal mining	0.000	0.000	0.000	0.000	-0.050	0.007	0.000
	chemicals	0.000	-0.011	-0.075	0.089	-0.015	0.012	-0.024
	rubber-plastics	0.000	0.005	-0.166	0.000	0.065	0.022	0.028
	stone-clay-glass	0.000	0.006	0.241	-0.089	0.000	-0.040	-0.004
	misc mfg	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7 MS	Services Materials							
	transportation	-0.018	-0.096	-0.126	0.000	-0.058	-0.016	-0.082
	trade	-0.021	0.046	-0.051	-0.003	-0.020	-0.201	-0.025
	FIRE	-0.036	-0.150	-0.009	-0.038	0.043	-0.012	0.004
	services	0.076		0.186	0.028	0.035	0.228	0.185
	OS	0.000	0.020	0.000	0.013	0.000	0.000	-0.081
8 TA	Textile-Apparel							
	textiles	0.089	-0.167	0.000	-0.401	-0.101	-0.096	0.113
	apparel	-0.089	0.167	0.000	-0.175	0.101	0.096	-0.113
	leather	0.000	0.000	0.000	0.576	0.000	0.000	0.000
9 WP	Wood-Paper							
	lumber wood	-0.044	-0.036	-0.056	0.033	-0.572	0.000	0.000
	furniture	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	paper	0.044	0.036	0.056	-0.051	0.047	0.000	0.028
	printing	0.000	0.000	0.000	0.019	0.524	0.000	-0.028
10 OS	Other Services							
	communications	-0.070	-0.110	-0.170	-0.073	-0.125	-0.038	0.147
	govt. enterp	0.070	-0.182	-0.091	0.000	-0.053	0.038	0.191
	non-comp. imports	0.000	0.291	0.261	0.073	0.178	0.000	-0.338
11 FM	Fab-other Metals							
	metal mining	0.000	0.123	0.000	0.000	0.000	0.000	0.000
	primary metals	-0.026	-0.098	-0.093	-0.088	0.206	-0.110	0.000
	fabricated metals	0.026	-0.025	0.093	0.088	-0.206	0.110	0.000
12 MC	Machinery Materials							
	industrial machinery	-0.242	0.000	0.000	0.000	0.000	0.022	-0.137
	electrical mach.	0.242	0.000	0.000	0.000	0.000	-0.022	0.137
13 EQ	Equipment							
	motor vehicles	-0.034	0.213	0.459	0.436	0.000	0.165	0.446
	other transp equip	-0.073	0.009	0.000	0.000	0.000	0.046	0.000
	instruments	0.107	-0.222	-0.459	-0.436	0.000	-0.211	-0.446

Table E3 (cont). Change in input bias terms for subtiers (1960-2005).

node	Components of node	8 Tobacco	9 Textile	10 Apparel	11 Lumber	12 Furniture	13 Paper	14 Printing
2 E	Energy							
	coal	-0.017	0.000	0.000	0.000	0.000	0.000	0.000
	oil mining	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	refining	0.169	0.169	0.152	0.135	0.105	0.163	0.132
	electric utilities	-0.041	-0.010	-0.031	-0.004	0.016	0.045	-0.025
	gas utilities	-0.111	-0.159	-0.121	-0.131	-0.121	-0.207	-0.107
3 M	Materials							
	construction	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Agriculture Mat.	-0.105	-0.080	-0.080	-0.045	-0.003	-0.148	-0.216
	Metallic Mat.	0.000	0.000	0.000	0.000	-0.038	0.000	0.000
	Nonmetallic Mat.	0.000	0.082	0.000	0.000	0.006	0.056	0.000
	Services Mat.	0.105	-0.002	0.080	0.045	0.034	0.092	0.216
4 MA	Agriculture Materials							
	agriculture	-0.099	-0.024	0.000	-0.003	0.000	0.000	0.000
	food	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	tobacco	0.105	0.000	0.000	0.000	0.000	0.000	0.000
	Textile-Apparel	0.000	0.024	0.000	0.000	-0.043	0.000	0.000
	Wood-Paper	-0.006	0.000	0.000	0.003	0.043	0.000	0.000
5 MM	Metallic Materials							
	Fab-Other Metals	-0.084	0.000	-0.087	-0.035	0.000	-0.096	-0.021
	Machinery	0.084	0.000	0.441	-0.005	0.000	0.026	0.068
	Equipment	0.000	0.000	-0.354	0.039	0.000	0.069	-0.047
6 MN	NonMetallic Materials							
	nonmetal mining	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	chemicals	0.094	0.000	0.111	-0.012	-0.027	-0.008	-0.057
	rubber-plastics	-0.094	0.000	-0.060	0.009	0.034	0.008	0.057
	stone-clay-glass	0.000	0.000	0.000	0.003	-0.007	0.000	0.000
	misc mfg	0.000	0.000	-0.051	0.000	0.000	0.000	0.000
7 MS	Services Materials							
	transportation	0.000	-0.011	-0.037	-0.050	-0.004	-0.041	-0.074
	trade	-0.005	-0.030	-0.067	0.027	0.018	-0.065	-0.026
	FIRE	0.000	-0.033	0.024	-0.014	-0.016	-0.002	0.050
	services	0.005		0.122	0.037	0.002	0.107	0.096
	OS	0.000	0.000	-0.042	0.000	0.000	0.000	-0.046
8 TA	Textile-Apparel							
	textiles	0.070	0.000	0.128	0.000	0.000	0.000	0.000
	apparel	-0.070	0.000	-0.128	0.000	0.000	0.000	0.000
	leather	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9 WP	Wood-Paper							
	lumber wood	0.000	0.000	0.386	0.000	-0.256	-0.008	0.000
	furniture	0.000	0.000	0.000	0.000	0.294	0.000	0.000
	paper	0.057	0.000	-0.393	0.000	-0.038	0.008	0.017
	printing	-0.057	0.000	0.007	0.000	0.000	0.000	-0.017
10 OS	Other Services							
	communications	0.029	0.012	-0.007	-0.061	-0.063	-0.069	-0.066
	govt. enterp	-0.073	0.018	0.148	0.061	0.040	-0.006	0.030
	non-comp. imports	0.044	-0.030	-0.141	0.000	0.024	0.074	0.036
11 FM	Fab-other Metals							
	metal mining	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	primary metals	0.000	-0.158	-0.030	0.000	0.000	0.058	-0.187
	fabricated metals	0.000	0.158	0.030	0.000	0.000	-0.058	0.187
12 MC	Machinery Materials							
	industrial machinery	-0.320	0.000	0.000	-0.059	0.100	-0.041	0.033
	electrical mach.	0.320	0.000	0.000	0.059	-0.100	0.041	-0.033
13 EQ	Equipment							
	motor vehicles	0.224	0.494	0.654	0.000	0.443	0.035	0.162
	other transp equip	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	instruments	-0.224	-0.494	-0.654	0.000	-0.443	-0.036	-0.162

Table E3 (cont). Change in input bias terms for subtiers (1960-2005).

node	Components of node	15 Chemical	16 Refining	17 Rubber	18 Leather	19 Stone, clay	20 Primary	21 Fabricated
2 E	Energy							
	coal	0.000	0.000	0.000	0.000	-0.024	-0.354	0.000
	oil mining	-0.057	-0.234	0.000	0.000	0.000	0.000	0.000
	refining	0.167	0.230	0.006	0.267	0.219	0.115	0.070
	electric utilities	0.113	0.000	0.177	-0.159	0.079	0.242	0.134
	gas utilities	-0.223	0.004	-0.183	-0.109	-0.274	-0.004	-0.204
3 M	Materials							
	construction	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Agriculture Mat.	0.000	0.000	-0.015	-0.036	-0.023	0.000	0.000
	Metallic Mat.	0.000	0.000	0.000	0.000	0.000	-0.058	-0.121
	Nonmetallic Mat.	-0.094	-0.030	0.019	0.022	-0.022	0.000	0.000
	Services Mat.	0.094	0.030	-0.004	0.014	0.046	0.058	0.121
4 MA	Agriculture Materials							
	agriculture	0.030	0.000	0.152	0.000	0.000	0.000	0.000
	food	-0.093	0.035	0.000	-0.027	0.000	0.000	0.000
	tobacco	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Textile-Apparel	0.000	0.000	-0.125	0.027	0.000	0.000	0.000
	Wood-Paper	0.063	-0.035	-0.027	0.000	0.000	0.000	0.000
5 MM	Metallic Materials							
	Fab-Other Metals	0.030	-0.084	-0.024	0.009	-0.012	-0.262	0.000
	Machinery	-0.030	-0.042	0.024	-0.009	-0.005	0.262	0.000
	Equipment	0.000	0.126	0.000	0.000	0.018	0.000	0.000
6 MN	NonMetallic Materials							
	nonmetal mining	0.000	-0.001	0.000	0.000	-0.019	0.000	0.000
	chemicals	0.000	-0.084	0.040	0.171	-0.001	-0.099	-0.011
	rubber-plastics	0.000	0.046	-0.040	-0.173	0.000	0.006	-0.033
	stone-clay-glass	0.000	0.040	0.000	0.000	0.020	0.093	0.044
	misc mfg	0.000	0.000	0.000	0.001	0.000	0.000	0.000
7 MS	Services Materials							
	transportation	-0.104	-0.317	-0.054	0.014	-0.116	-0.028	-0.008
	trade	-0.031	0.153	-0.013	-0.065	-0.024	-0.119	-0.049
	FIRE	-0.011	0.059	-0.011	0.059	0.077	-0.020	-0.030
	services	0.145		0.149	-0.015	0.069	0.167	0.086
	OS	0.000	0.000	-0.071	0.008	-0.006	0.000	0.000
8 TA	Textile-Apparel							
	textiles	0.027	-0.455	0.000	0.018	0.000	-0.151	-0.021
	apparel	-0.027	0.000	0.000	0.000	0.000	0.067	-0.484
	leather	0.000	0.455	0.000	-0.018	0.000	0.084	0.505
9 WP	Wood-Paper							
	lumber wood	0.000	0.127	0.000	-0.140	0.060	-0.035	-0.102
	furniture	0.000	0.000	0.000	0.000	0.000	0.088	0.000
	paper	0.008	-0.127	0.000	0.140	-0.060	-0.088	0.243
	printing	-0.008	0.000	0.000	0.000	0.000	0.035	-0.141
10 OS	Other Services							
	communications	-0.063	-0.009	0.254	-0.070	-0.047	0.114	-0.161
	govt. enterp	0.007	-0.004	0.071	0.070	0.046	0.081	-0.008
	non-comp. imports	0.056	0.013	-0.325	0.000	0.001	-0.196	0.169
11 FM	Fab-other Metals							
	metal mining	0.078	0.000	0.000	0.000	0.000	-0.019	0.000
	primary metals	-0.089	-0.014	0.010	0.000	0.020	0.019	-0.077
	fabricated metals	0.012	0.014	-0.010	0.000	-0.020	0.000	0.077
12 MC	Machinery Materials							
	industrial machinery	-0.049	-0.095	-0.007	-0.003	0.001	0.008	-0.008
	electrical mach.	0.049	0.095	0.007	0.003	-0.001	-0.008	0.008
13 EQ	Equipment							
	motor vehicles	0.207	0.216	0.176	0.517	0.332	0.214	0.150
	other transp equip	0.000	0.000	0.000	0.000	0.000	0.011	0.000
	instruments	-0.207	-0.216	-0.176	-0.517	-0.332	-0.225	-0.150

Table E3 (cont). Change in input bias terms for subtiers (1960-2005).

node	Components of node	22 Ind Mach	23 Elect Mach	24 Motor Veh	25 Transp Eq	26 Instruments	27 Misc mfg	28 Transport
2 E	Energy							
	coal	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	oil mining	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	refining	0.096	0.062	0.134	0.128	0.107	0.210	0.012
	electric utilities	0.004	-0.022	0.064	-0.017	-0.052	-0.129	-0.012
	gas utilities	-0.101	-0.039	-0.198	-0.110	-0.055	-0.080	0.000
3 M	Materials							
	construction	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Agriculture Mat.	0.000	0.000	0.000	0.000	0.002	-0.034	0.000
	Metallic Mat.	-0.048	-0.040	-0.039	-0.104	-0.028	-0.074	0.000
	Nonmetallic Mat.	0.000	0.022	0.018	0.000	-0.001	0.074	0.000
	Services Mat.	0.048	0.017	0.021	0.104	0.026	0.034	0.000
4 MA	Agriculture Materials							
	agriculture	0.000	0.000	0.000	0.008	0.000	0.000	0.000
	food	0.000	0.000	0.000	0.000	0.000	0.000	-0.079
	tobacco	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Textile-Apparel	-0.031	0.000	-0.405	-0.277	-0.035	-0.052	-0.157
	Wood-Paper	0.031	0.000	0.405	0.270	0.035	0.052	0.236
5 MM	Metallic Materials							
	Fab-Other Metals	0.076	0.137	-0.070	0.083	0.042	-0.087	-0.005
	Machinery	-0.076	-0.137	-0.042	0.023	0.029	0.087	-0.030
	Equipment	0.000	0.000	0.111	-0.107	-0.071	0.000	0.035
6 MN	NonMetallic Materials							
	nonmetal mining	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	chemicals	-0.032	0.011	-0.004	-0.011	-0.121	-0.020	-0.150
	rubber-plastics	0.069	0.009	0.111	-0.029	0.173	-0.003	0.150
	stone-clay-glass	-0.037	-0.020	-0.107	0.040	-0.052	0.000	0.000
	misc mfg	0.000	0.000	0.000	0.000	0.000	0.022	0.000
7 MS	Services Materials							
	transportation	-0.070	0.003	-0.024	0.002	-0.006	-0.001	-0.102
	trade	0.045	-0.060	0.031	-0.004	-0.047	0.046	-0.048
	FIRE	-0.060	-0.007	0.033	-0.006	0.009	-0.016	-0.017
	services	0.065		-0.039	0.008	0.054	0.048	0.141
	OS	0.021	-0.022	0.000	0.000	-0.010	-0.077	0.025
8 TA	Textile-Apparel							
	textiles	0.000	0.028	0.061	-0.064	0.000	0.075	0.044
	apparel	0.000	-0.028	-0.061	0.064	0.000	0.010	-0.044
	leather	0.000	0.000	0.000	0.000	0.000	-0.085	0.000
9 WP	Wood-Paper							
	lumber wood	0.012	0.000	0.000	-0.304	0.000	-0.052	0.108
	furniture	0.000	0.274	0.000	0.352	0.274	0.110	0.000
	paper	-0.012	-0.274	0.000	-0.048	-0.274	-0.058	-0.019
	printing	0.000	0.000	0.000	0.000	0.000	0.000	-0.089
10 OS	Other Services							
	communications	0.000	-0.150	-0.061	-0.065	-0.049	0.187	-0.044
	govt. enterp	0.000	-0.071	-0.081	-0.011	-0.015	0.313	0.000
	non-comp. imports	0.000	0.221	0.142	0.076	0.064	-0.500	0.044
11 FM	Fab-other Metals							
	metal mining	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	primary metals	-0.107	-0.095	-0.029	-0.110	-0.167	-0.058	-0.176
	fabricated metals	0.107	0.095	0.029	0.110	0.167	0.058	0.176
12 MC	Machinery Materials							
	industrial machinery	-0.168	0.000	-0.043	-0.130	-0.043	-0.067	-0.061
	electrical mach.	0.168	0.000	0.043	0.130	0.043	0.067	0.061
13 EQ	Equipment							
	motor vehicles	0.282	0.000	0.000	0.000	0.000	0.425	0.168
	other transp equip	0.000	0.000	0.000	0.025	0.000	0.045	-0.168
	instruments	-0.282	0.000	0.000	-0.025	0.000	-0.470	0.000

Table E3 (cont). Change in input bias terms for subtiers (1960-2005).

node	Components of node	29 Communic	30 Electric Ut	31 Gas Utilities	32 Trade	33 FIRE	34 Services	35 Gov Enterp
2 E	Energy							
	coal	0.000	-0.106	0.000	0.000	0.000	0.000	0.000
	oil mining	0.000	-0.052	0.076	0.000	0.000	0.000	0.000
	refining	0.106	0.180	0.000	0.095	0.008	0.132	0.236
	electric utilities	-0.106	-0.024	0.000	0.023	0.074	0.028	-0.005
	gas utilities	0.000	0.002	-0.076	-0.118	-0.082	-0.160	-0.231
3 M	Materials							
	construction	0.000	-0.095	0.000	0.000	0.000	0.000	-0.040
	Agriculture Mat.	0.000	0.000	-0.003	-0.068	0.000	0.000	0.000
	Metallic Mat.	-0.016	0.015	-0.028	0.000	0.000	-0.024	0.020
	Nonmetallic Mat.	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Services Mat.	0.016	0.079	0.031	0.068	0.000	0.024	0.020
4 MA	Agriculture Materials							
	agriculture	0.000	0.000	0.000	0.030	0.137	0.014	-0.049
	food	0.000	0.000	0.000	-0.002	0.000	0.017	-0.158
	tobacco	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Textile-Apparel	0.000	0.000	0.000	0.000	0.000	-0.066	-0.065
	Wood-Paper	0.000	0.000	0.000	-0.028	-0.137	0.035	0.272
5 MM	Metallic Materials							
	Fab-Other Metals	0.000	-0.032	0.165	-0.090	0.039	-0.016	0.000
	Machinery	0.000	-0.003	-0.165	-0.028	-0.006	0.070	-0.010
	Equipment	0.000	0.035	0.000	0.118	-0.033	-0.054	0.010
6 MN	NonMetallic Materials							
	nonmetal mining	0.000	0.000	0.000	0.000	-0.091	0.000	0.000
	chemicals	-0.041	-0.029	-0.005	-0.011	-0.034	-0.025	-0.086
	rubber-plastics	0.048	0.045	0.007	0.019	0.136	0.028	0.000
	stone-clay-glass	-0.009	-0.016	0.014	-0.007	0.112	0.010	0.086
	misc mfg	0.002	0.000	-0.015	-0.001	-0.122	-0.013	0.000
7 MS	Services Materials							
	transportation	0.000	-0.274	0.077	0.000	0.000	0.000	-0.059
	trade	0.000	-0.009	0.017	-0.005	0.000	-0.005	-0.046
	FIRE	-0.005	0.052	0.219	-0.036	-0.052	-0.003	0.130
	services	0.001		-0.330	0.038	0.074	0.014	-0.003
	OS	0.004	-0.013	0.016	0.003	-0.022	-0.006	-0.022
8 TA	Textile-Apparel							
	textiles	-0.121	0.137	-0.011	0.134	-0.121	0.041	-0.124
	apparel	0.121	-0.137	0.011	-0.134	0.071	-0.060	0.005
	leather	0.000	0.000	0.000	0.000	0.050	0.019	0.119
9 WP	Wood-Paper							
	lumber wood	0.083	0.240	0.068	0.013	0.067	0.000	-0.108
	furniture	0.000	0.000	0.000	0.000	0.000	0.000	0.306
	paper	-0.024	-0.065	-0.068	-0.086	0.017	0.062	0.015
	printing	-0.059	-0.175	0.000	0.073	-0.084	-0.062	-0.213
10 OS	Other Services							
	communications	-0.062	-0.074	-0.181	-0.043	-0.047	-0.002	0.021
	govt. enterp	0.000	0.074	-0.093	-0.024	-0.067	-0.013	0.131
	non-comp. imports	0.062	0.000	0.275	0.067	0.115	0.015	-0.152
11 FM	Fab-other Metals							
	metal mining	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	primary metals	-0.126	-0.048	-0.058	0.016	-0.138	0.000	-0.170
	fabricated metals	0.126	0.048	0.058	-0.016	0.138	0.000	0.170
12 MC	Machinery Materials							
	industrial machinery	-0.055	-0.004	0.075	-0.134	0.071	-0.042	0.124
	electrical mach.	0.055	0.004	-0.075	0.134	-0.071	0.042	-0.124
13 EQ	Equipment							
	motor vehicles	0.164	0.194	0.398	0.000	0.151	-0.092	0.167
	other transp equip	-0.065	0.000	0.047	0.000	0.000	0.000	-0.167
	instruments	-0.099	-0.194	-0.445	0.000	-0.151	0.092	0.000

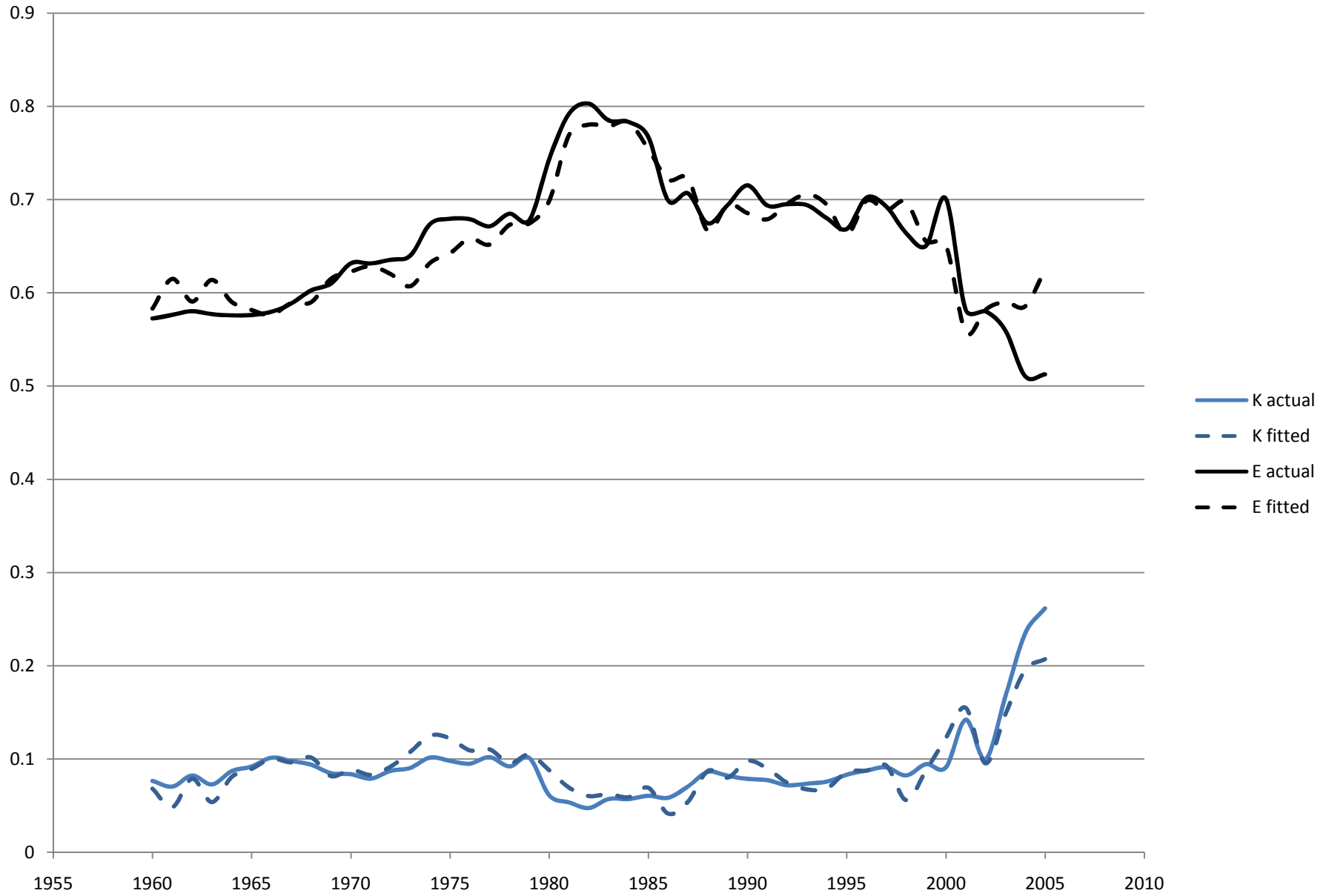Figure E1. Fitted vs. actual input shares, Petroleum Refining (ind. 16)

Figure E2. Fitted vs. actual input shares, Electric Utilities(ind. 30)
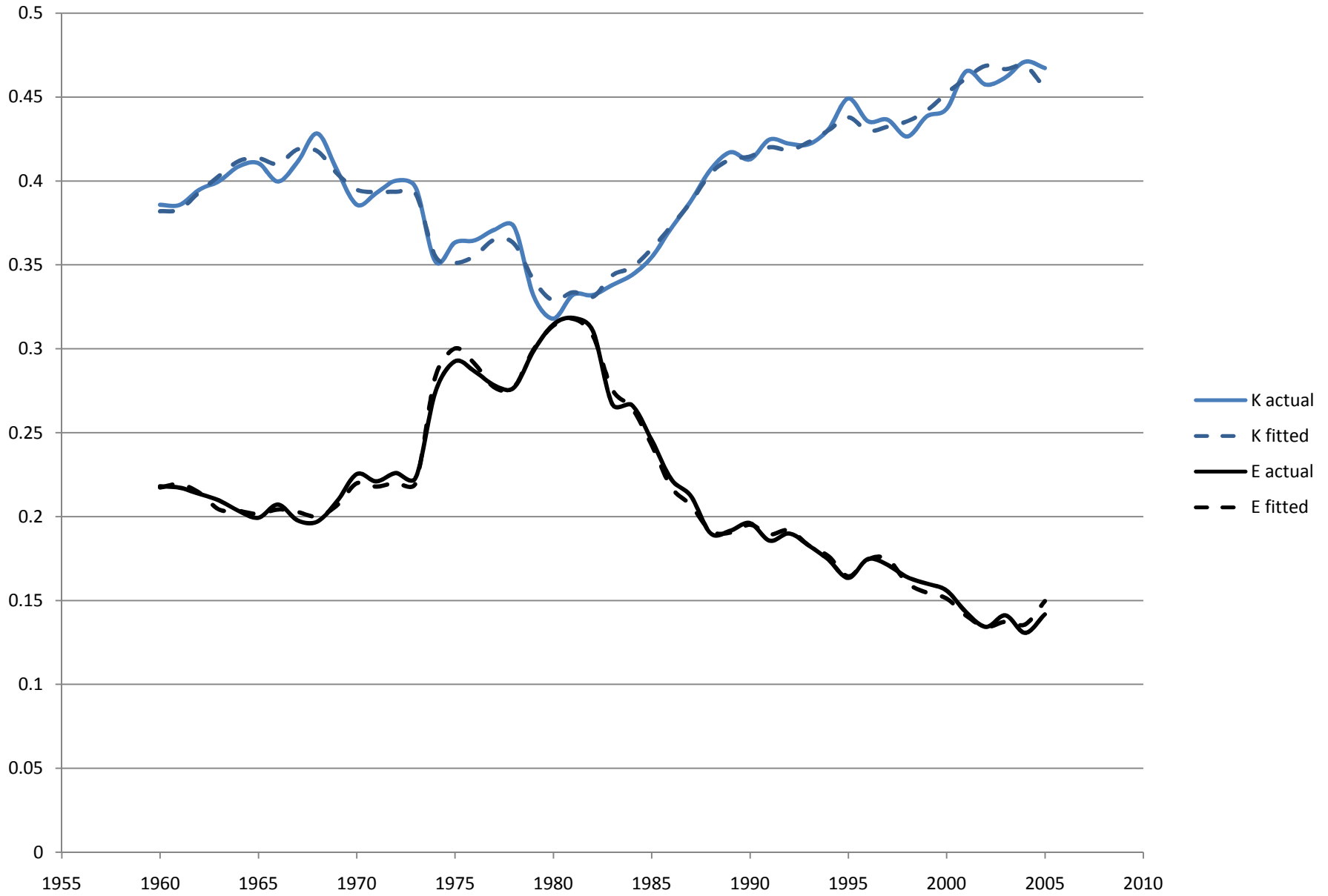
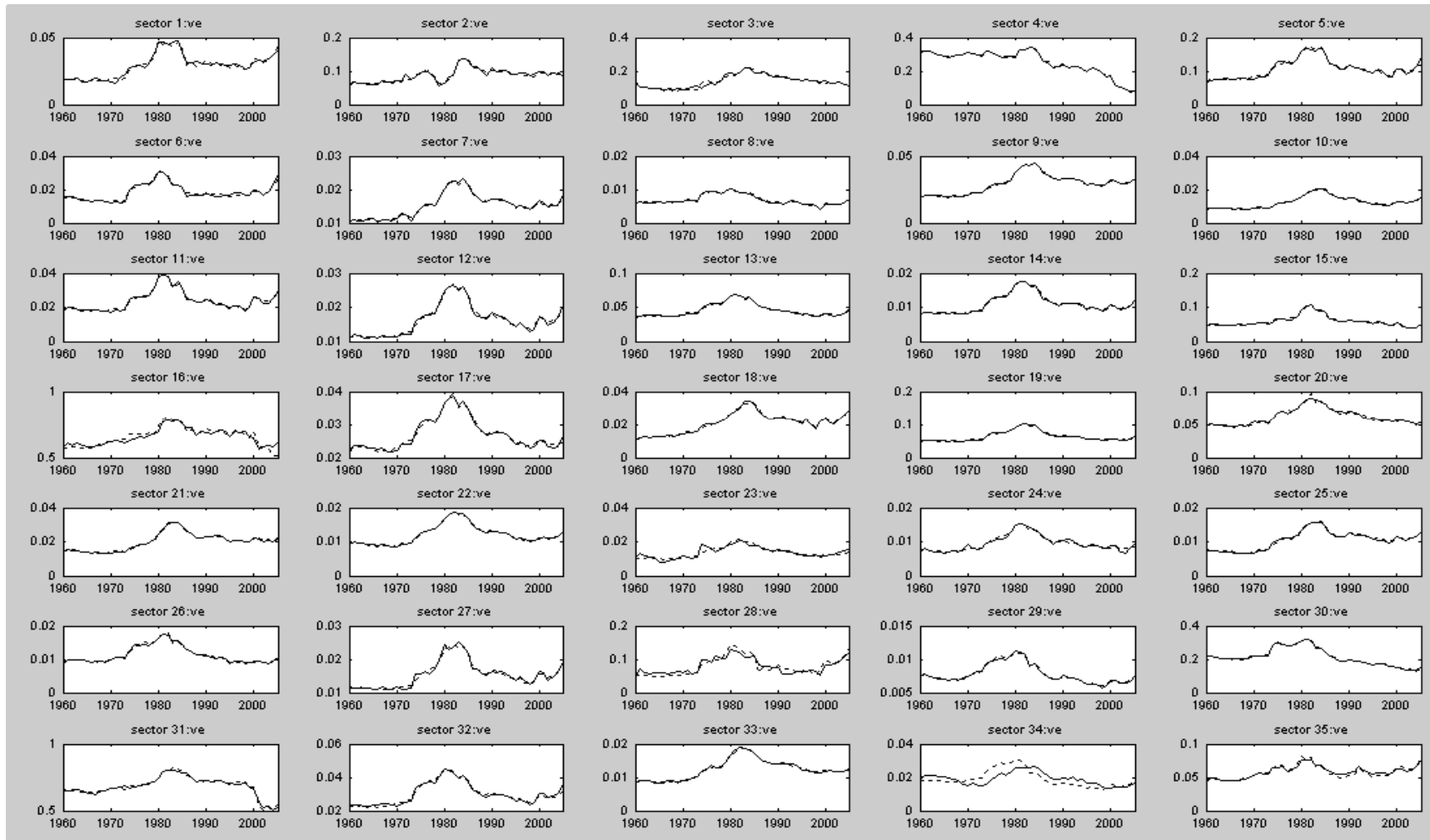Fig. E.3. Fitted vs. actual shares for energy input, all industries

Fig. E.4. Fitted vs. actual shares for material input, all industries