



Research article

The competitiveness measurement of new energy vehicle industry based on grey relational analysis

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Supplementary

Table S1. Data of each province under the competitiveness index in 2017.

	Jiangsu	Shanghai	Beijing	Zhejiang	Hubei	Hunan	Hebei	Henan	Anhui	Fujian	Sichuan	Shandong	Guangdong
Per capita disposable income (yuan)	35024.1	58988	57230	42046	23757	23103	21484	20170	21863.3	30048	20580	26930	33003.29
Regional GDP per capita (yuan)	107150	136109	128994	92057	60113	49448	45387	47130	43401	82976	44651	63162	82686
Private car ownership (10,000 units)	1408.2	274.41	467.2	1228	605.67	630.42	1279	1010	882.41	491.72	894	800	750
NEV industry vehicle output (10,000 units)	5.06	6.1	3.54	3.3	7.04	2.53	0.87	3.9	6.67	1.5	2.4	14.12	3.05
NEV sales (10,000 units)	11.2	6.14	4.8	6.29	1.2	1.74	2.8	3.88	2	2.1	3.1	4	7.1
Automobile-related major colleges (institutes) (number of undergraduate colleges)	77	38	67	9	68	51	61	55	45	37	51	67	64
Public charging (exchanging) station and pile (10,000 seats)	4	3.01	3	0.88	0.62	0.37	0.99	0.43	0.5	1.94	0.3	0.31	3.01
Number of enterprises above designated size	1886	1880	102	2025	1663	3556	253	644	14	9	100	108	110
Total assets of NEV industry (100 million)	6221.17	6500	6600	6042	5800	5700	6000	2073.06	1100	500	1400	1300	1500
NEV industry output value (100 million)	710	500	400	370	380	310	341	410	210	90	170	80	109
Regional GDP	85900.94	30133.86	28000.4	52403.13	35478.9	33828.1	35964	44552.83	29676.22	32298	36980.2	63012.1	91648.7
Average number of employees in the NEV industry (10,000 people)	41	44	42	16.7	20	15	7	6.34	5	4	13	16	19
NEV export volume (10,000 units)	0.9	0.91	0.92	0.94	0.51	0.43	0.21	0.22	0.11	0.09	0.06	0.05	0.08
Market share	1.31	1.35	1.38	1.4	0.51	0.44	0.6	0.55	0.42	0.22	0.13	0.19	0.21
Profit ratio of sales	0.09	0.095	0.091	0.089	0.085	0.082	0.07	0.074	0.061	0.069	0.071	0.073	0.069
Growth rate of the number of enterprises above designated size	0.11	0.2	0.18	0.19	0.09	0.073	0.056	0.06	0.041	0.031	0.044	0.062	0.066
Number of NEV companies (ten thousand)	0.67	0.6	0.04	0.6	0.66	0.55	0.12	0.1	0.05	0.04	0.052	0.05	0.06

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Volume 20, Issue 2, 3146-3176.

	Jiangsu	Shanghai	Beijing	Zhejiang	Hubei	Hunan	Hebei	Henan	Anhui	Fujian	Sichuan	Shandong	Guangdong
NEV patent applications	150	300	200	150	100	90	30	10	80	5	45	55	40
Proportion of high-level employees	0.22	0.25	0.23	0.21	0.18	0.15	0.09	0.07	0.06	0.05	0.04	0.04	0.03
Total output value of new industrial products (100 million yuan)	8	8.8	9	10	5	5.1	6	6.2	4.1	1.5	1.8	1.5	1.3
NEV technology research and development expenses (100 million yuan)	400	500	600	450	300	350	250	230	200	260	270	210	220
Number of supporting enterprises	60	50	110	130	70	55	90	100	110	20	30	5	15
Total output value of supporting enterprises (100 million yuan)	40	45	65	75	30	25	20	17	15	10	18	11	8
Number of NEV experience stores (houses)	13	18	40	30	13	11	14	3	5	8	17	9	8
Government investment (ten thousand yuan)	1500	2000	2500	2300	800	750	700	660	500	440	610	480	560
Tax reduction and exemption policy	30	35	30	22	20	19	17	13	10	6	7	5	9

Table S2. Data of each province under the competitiveness index in 2018.

	Jiangsu	Shanghai	Beijing	Zhejiang	Hubei	Hunan	Hebei	Henan	Anhui	Fujian	Sichuan	Shandong	Guangdong
Per capita disposable income (yuan)	38095.8	64182.6	62361	45840	24716	25241	23446	21963	23983.6	32644	22461	29205	35810
Regional GDP per capita (yuan)	115168	148744	153095	98643	66531	52809	43108	50152	47712	91197	48883	66472	88781
Private car ownership (10,000 units)	1537.62	302.17	307.1	1347	690.79	722.34	1411.48	1166	963.6	544.2	976.7	1300	1000
NEV industry vehicle output (10,000 units)	12.1	14.1	1.44	6.2	5.3	7.97	2.74	5.63	15.8	2.46	2.4	17	13.27
NEV sales (10,000 units)	16.4	7	5	8.64	2.04	2	3	4.62	2.7	2.6	3.5	5.8	8.5

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	Jiangsu	Shanghai	Beijing	Zhejiang	Hubei	Hunan	Hebei	Henan	Anhui	Fujian	Sichuan	Shandong	Guangdong
Automobile-related major colleges (institutes) (number of undergraduate colleges)	51	36	61	38	46	36	44	50	35	30	42	56	47
Public charging (exchanging) station and pile (10,000 seats)	5.5	5.01	4.46	1.67	1.08	0.56	1.5	0.69	2	2.1	1.01	2.81	5.21
Number of enterprises above designated size	1896	1900	148	2129	1559	3820	246	642	19	11	100	110	120
Total assets of NEV industry (100 million)	7034.85	7500	8000	7148	4800	4900	5500	1900.34	1400	800	1588	1800	2000
NEV industry output value (100 million)	710	660	680	600	430	450	420	400	300	100	250	110	150
Regional GDP	92595.4	32679.87	30320	58002.84	39366.55	36329.7	36010.3	49936.9	34010.91	35804	40678.1	66648.9	99945.2
Average number of employees in the NEV industry (10,000 people)	46.9	48	45	17.5	28	22	10	5.92	11	8	31	29	25
NEV export volume (10,000 units)	1.1	1.3	1.4	1	0.7	0.5	0.3	0.33	0.22	0.12	0.1	0.08	0.1
Market share	1.4	1.5	1.34	1.49	0.7	0.65	0.71	0.63	0.51	0.31	0.22	0.3	0.36
Profit ratio of sales	0.11	0.13	0.15	0.1	0.098	0.093	0.09	0.097	0.08	0.071	0.082	0.08	0.086
Growth rate of the number of enterprises above designated size	0.15	0.2	0.22	0.223	-0.062	0.074	0.06	0.075	0.052	0.057	0.061	0.065	0.07
Number of NEV companies (ten thousand)	0.9	0.7	0.05	0.7	0.76	0.61	0.17	0.19	0.09	0.07	0.1	0.07	0.09
NEV patent applications	200	417	230	170	130	110	50	30	120	20	80	75	60
Proportion of high-level employees	0.3	0.31	0.33	0.25	0.2	0.18	0.15	0.11	0.15	0.11	0.13	0.12	0.1
Total output value of new industrial products (100 million yuan)	10	11	10.5	11.1	6.5	6.8	7	7.1	5.1	2	2.3	2.1	3

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	Jiangsu	Shanghai	Beijing	Zhejiang	Hubei	Hunan	Hebei	Henan	Anhui	Fujian	Sichuan	Shandong	Guangdong
NEV technology research and development expenses (100 million yuan)	450	550	650	500	350	400	300	280	250	310	320	260	270
Number of supporting enterprises	80	60	120	150	80	68	100	110	120	30	40	10	20
Total output value of supporting enterprises (100 million yuan)	45	50	70	80	35	30	25	22	20	15	22	16	13
Number of NEV experience stores (houses)	15	20	37	33	18	14	19	4	6	10	20	11	14
Government investment (ten thousand yuan)	1900	2400	2800	2500	900	800	750	700	550	500	700	500	510
Tax reduction and exemption policy	35	40	35	30	25	27	22	18	15	13	17	14	19

Table S3. Data of each province under the competitiveness index in 2019.

	Jiangsu	Shanghai	Beijing	Zhejiang	Hubei	Hunan	Hebei	Henan	Anhui	Fujian	Sichuan	Shandong	Guangdong
Per capita disposable income (yuan)	41399.7	69441.6	67756	49899	26996	27680	25665	23902	26415.1	35616	24703	31597	39014
Regional GDP per capita (yuan)	123607	157279	164220	107624	77387	57746	46348	56388	58496	107139	55774	70129	94448
Private car ownership (10,000 units)	1646.03	1321.29	1497	1460	772.35	807.96	1518.86	1327	1043.58	590.51	1061.4	1500	1300
NEV industry vehicle output (10,000 units)	5	18.5	1.5174	6	6.0554	11.8	4.4991	6.93	12	1.81	3.2	5.85	15.59
NEV sales (10,000 units)	4.6	6.8	8.6	8.4	2.7	1.9	2.6	4.6	3	3.9	3.8	6.2	20.4
Automobile-related major colleges (institutes) (number of undergraduate colleges)	83	42	74	60	71	52	61	58	47	39	53	73	68
Public charging (exchanging) station and pile (10,000 seats)	6.05	5.51	5.91	3.32	1.8	1.2	2.23	1.03	2.58	2.74	1.7	3.23	6.28

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	Jiangsu	Shanghai	Beijing	Zhejiang	Hubei	Hunan	Hebei	Henan	Anhui	Fujian	Sichuan	Shandong	Guangdong
Number of enterprises above designated size	2132	2500	1450	2266	1558	1000	199	629	70	20	100	500	550
Total assets of NEV industry (100 million)	7141.32	8000	8800	7770	5000	5100	6000	1785.77	1700	1000	1800	2000	2500
NEV industry output value (100 million)	800	880	900	870	500	510	600	640	480	100	180	200	250
Regional GDP	99631.5	38155.32	35445.10	62351.74	45828.31	39894.1	35104.5	54259.2	37113.98	42395	46615.82	70540.5	107986.9
Average number of employees in the NEV industry (10,000 people)	47.16	50	55	11	35	38	30	19	20	18	39	40	42
NEV export volume (10,000 units)	3.02	3.25	3.3	1.6	1.5	1.8	0.24	0.2	0.31	0.34	0.3	0.13	0.22
Market share	2.8	2.9	2.9	2.5	2.7	1.9	1.8	1.5	1.1	1.2	1.5	1.4	1.3
Profit ratio of sales	0.09	0.94	0.095	0.0949	0.088	0.89	0.08	0.087	0.07	0.06	0.081	0.075	0.078
Growth rate of the number of enterprises above designated size	0.1	0.12	0.013	-0.172	-0.05	-0.03	0.059	0.069	0.05	0.03	0.06	0.03	0.04
Number of NEV companies (ten thousand)	0.5	0.6	0.68	0.78	0.87	0.75	0.15	0.14	0.1	0.09	0.15	0.11	0.13
NEV patent applications	290	300	320	250	220	210	70	10	126	50	150	120	100
Proportion of high-level employees	0.32	0.34	0.4	0.31	0.25	0.24	0.2	0.19	0.21	0.16	0.27	0.17	0.18
Total output value of new industrial products (100 million yuan)	8	8.8	9	8.7	5	5.1	6	6.4	4.9	1	1.8	2	2.5
NEV technology research and development expenses (100 million yuan)	500	600	700	550	400	440	330	350	300	360	370	310	320
Number of supporting enterprises	100	80	150	200	90	88	110	120	150	50	60	20	30
Total output value of supporting enterprises (100 million yuan)	50	60	80	90	40	35	30	28	25	20	27	21	18

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	Jiangsu	Shanghai	Beijing	Zhejiang	Hubei	Hunan	Hebei	Henan	Anhui	Fujian	Sichuan	Shandong	Guangdong
Number of NEV experience stores (houses)	20	25	28	40	20	25	16	4	6	13	23	11	14
Government investment (ten thousand yuan)	2000	2500	3000	2600	1000	850	800	750	600	500	770	550	560
Tax reduction and exemption policy	40	50	45	43	35	30	26	23	20	18	22	19	24



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