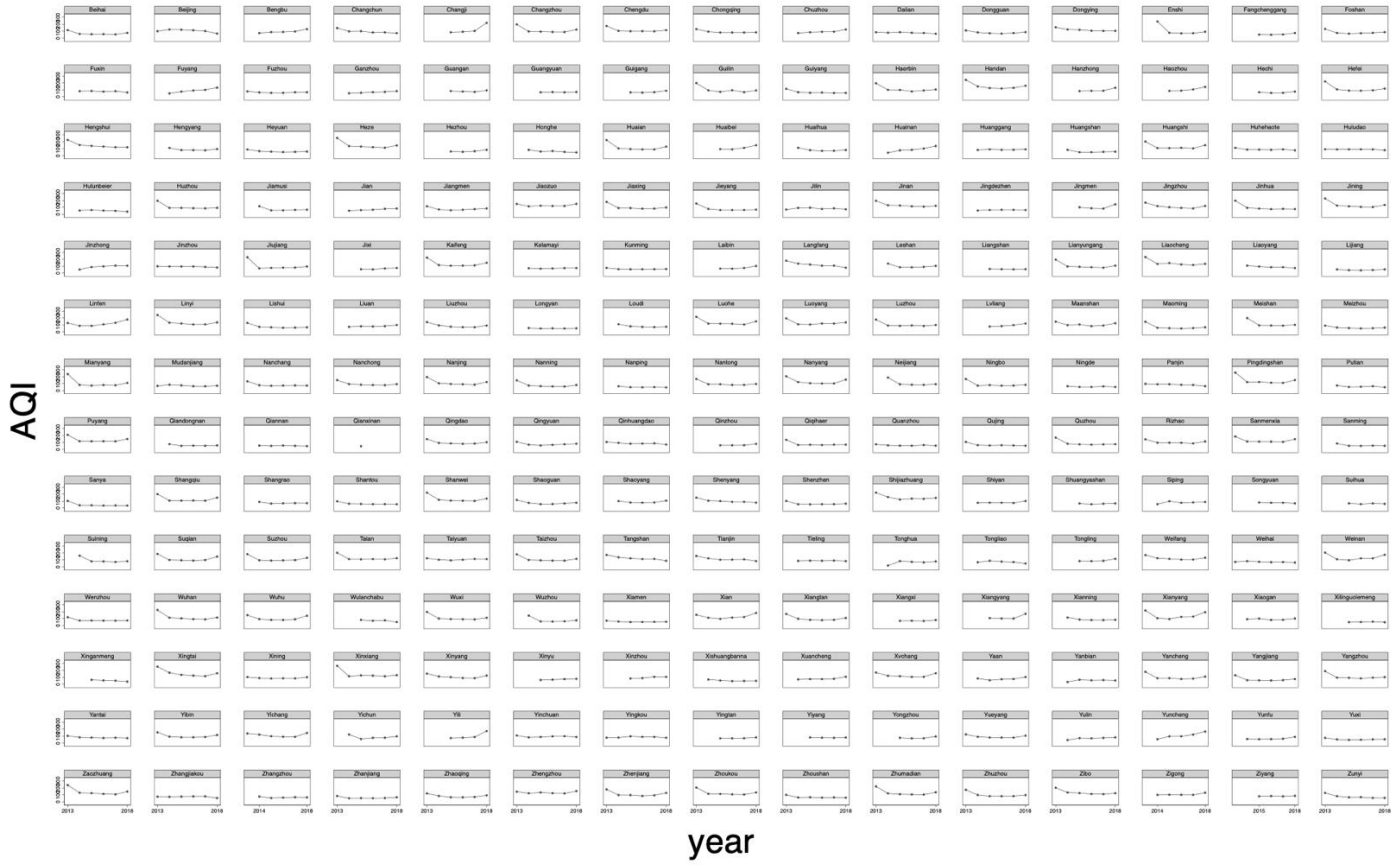
The Appendix

Figure S1 AQI of 210 cities from 2013 to



2018 Graphs by City

Figure S2 AQI in 5 tiers of cities

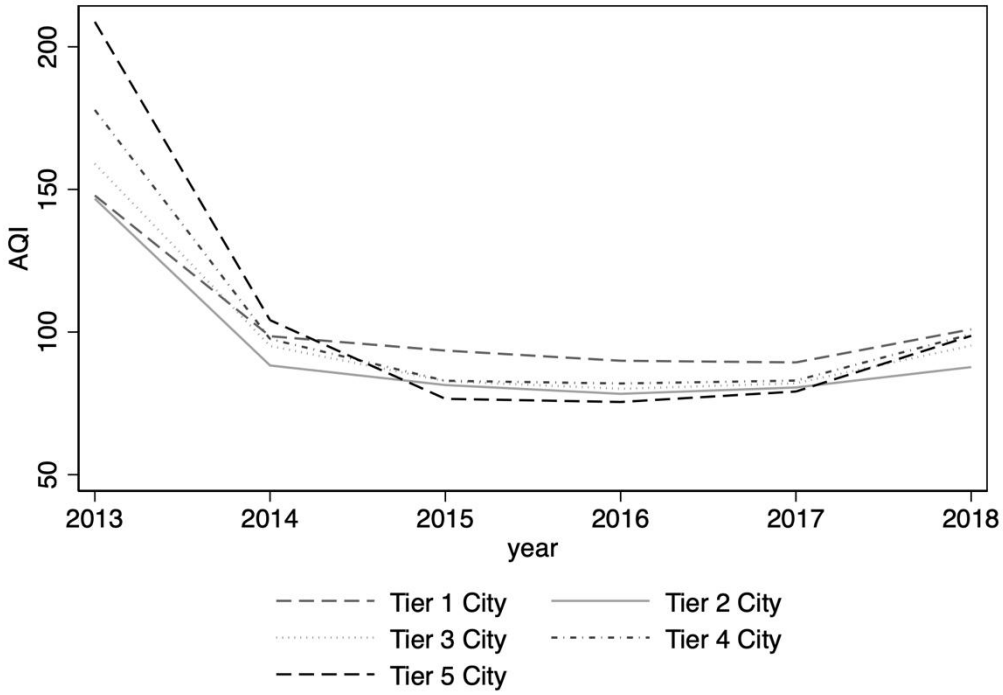


Figure S3 $PM_{2.5}$ concentration in 5 tiers of cities

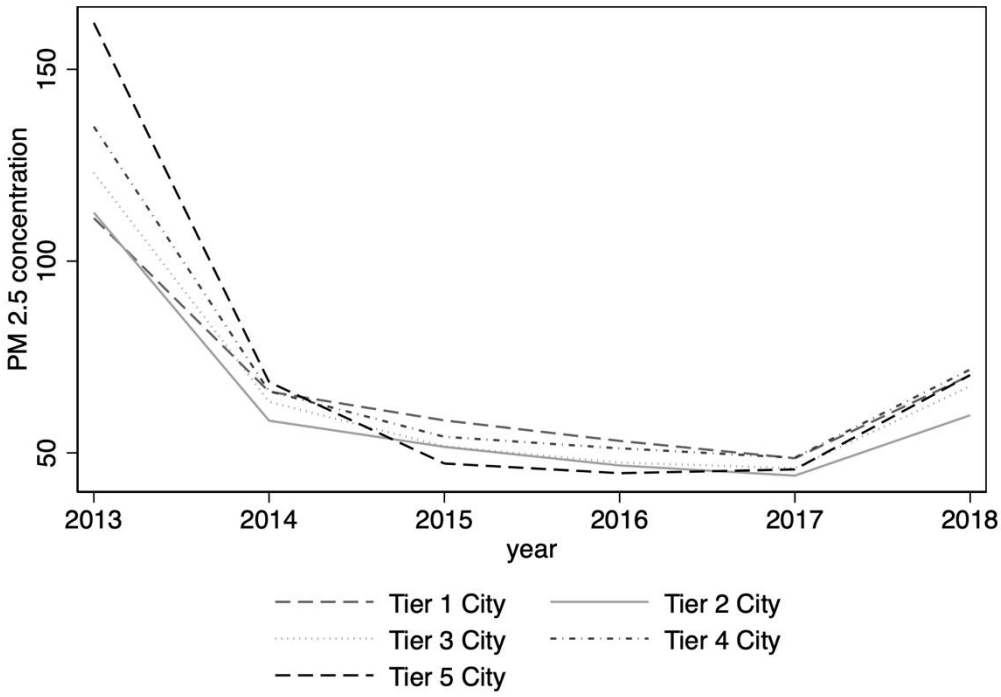


Figure S4 PM_{10} concentration in 5 tiers of cities

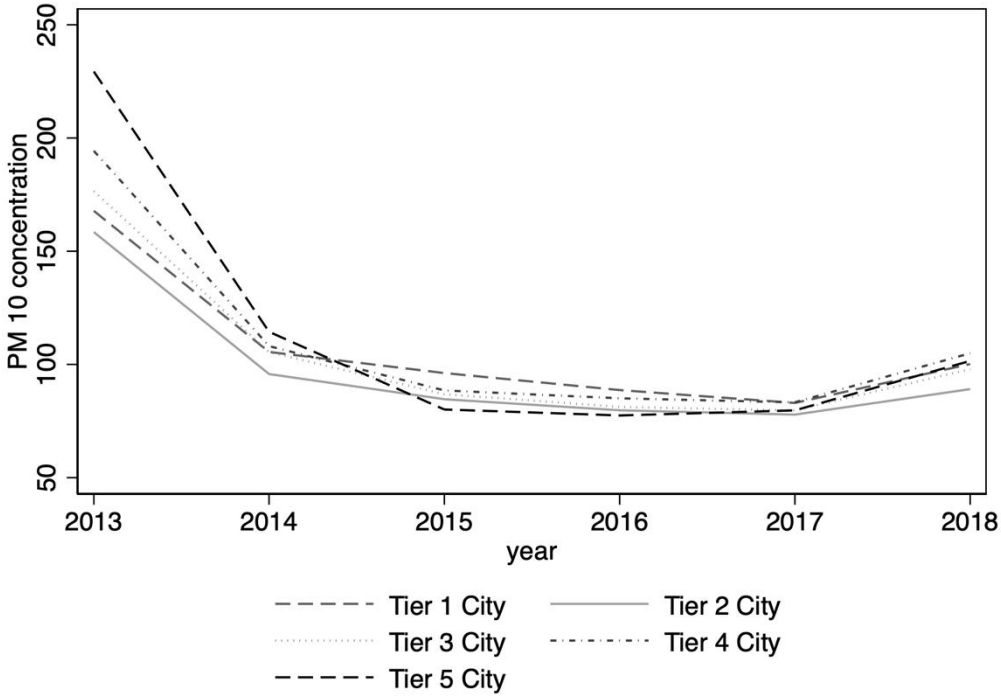


Figure S5 SO_2 concentration in 5 tiers of cities

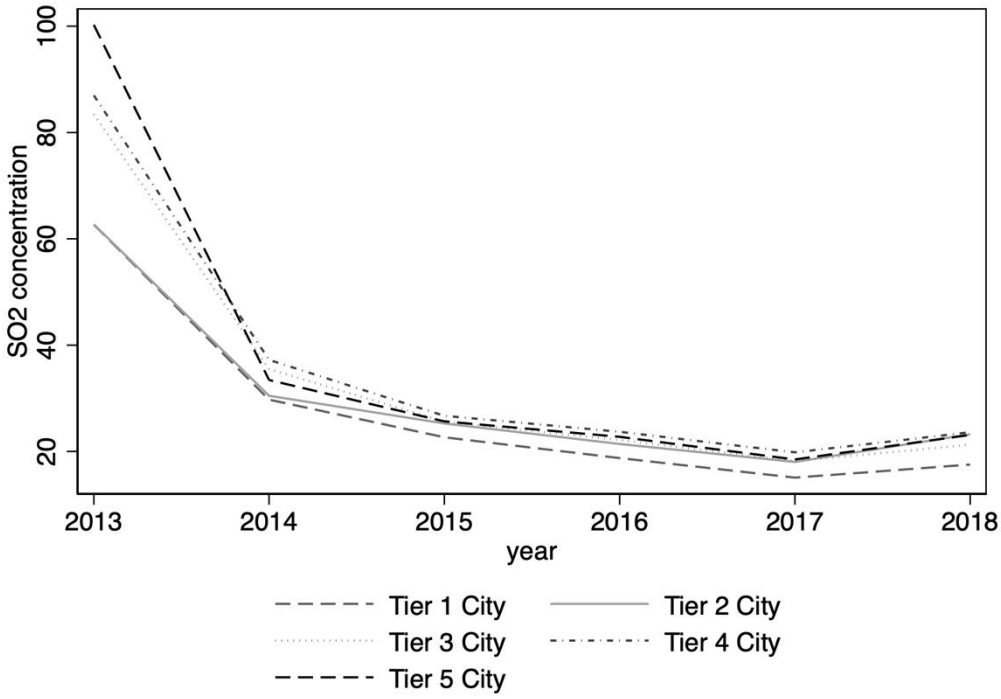


Figure S6 NO_2 concentration in 5 tiers of cities

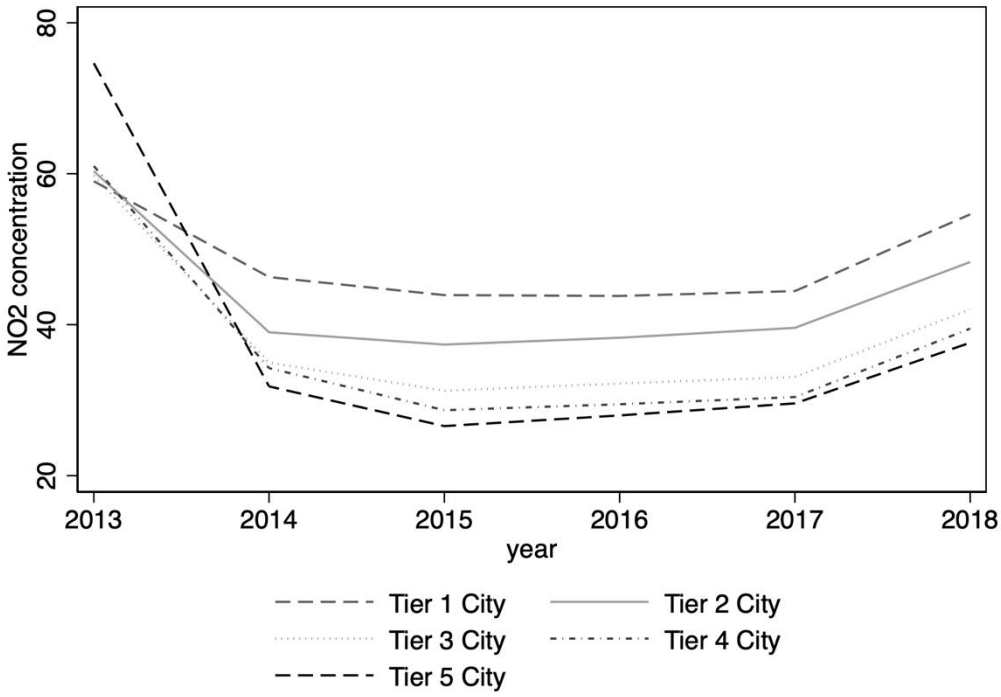


Figure S7 CO concentration in 5 tiers of cities

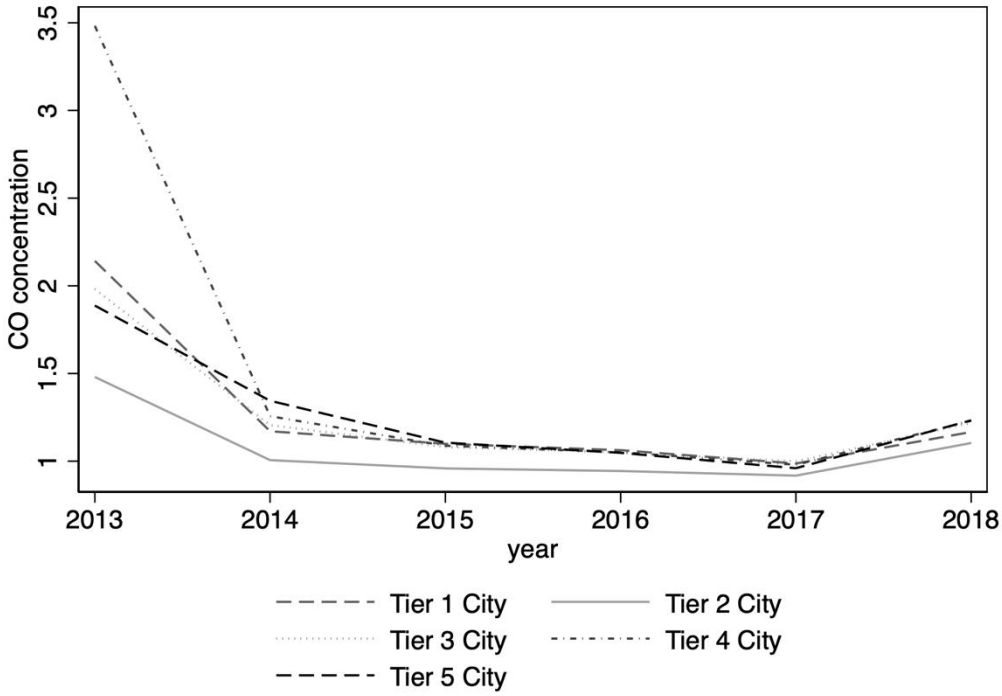


Figure S8 CO concentration in 5 tiers of cities

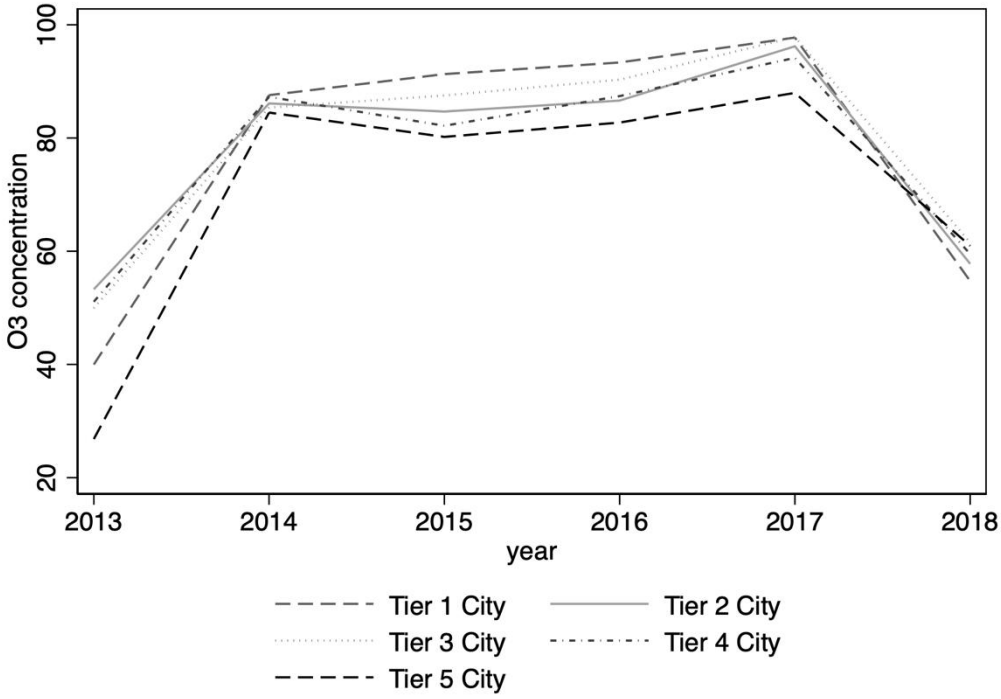


Table S1 Benford's analysis of AQI in 2013

Digit	Count	Percent	Benford	Gap
1	1458	43.354	30.103	-13.251
2	610	18.139	17.609	-0.53
3	290	8.623	12.494	3.871
4	150	4.46	9.691	5.231
5	111	3.301	7.918	4.617
6	169	5.025	6.695	1.67
7	169	5.025	5.799	0.774
8	208	6.185	5.115	-1.07
9	198	5.888	4.576	-1.312
SUM	3363	100	100	0.020
K-S	0.132		RATIO	6.465

Table S2 Benford's analysis of AQI in 2014

Digit	Count	Percent	Benford	Gap
1	13440	29.143	30.103	0.96
2	3140	6.809	17.609	10.8
3	2549	5.527	12.494	6.967
4	3474	7.533	9.691	2.158
5	5312	11.519	7.918	-3.601
6	5132	11.128	6.695	-4.433
7	4905	10.636	5.799	-4.837
8	4407	9.556	5.115	-4.441
9	3758	8.149	4.576	-3.573
SUM	46117	100	100	0.005
K-S	0.0697		RATIO	12.890

Table S3 Benford's analysis of AQI in 2015

Digit	Count	Percent	Benford	Gap
1	16876	21.879	30.103	8.224
2	4244	5.502	17.609	12.107
3	6318	8.191	12.494	4.303
4	8705	11.285	9.691	-1.594
5	11216	14.541	7.918	-6.623
6	9737	12.623	6.695	-5.928
7	7986	10.353	5.799	-4.554
8	6754	8.756	5.115	-3.641
9	5299	6.87	4.576	-2.294
SUM	77135	100	100	0.004
K-S	0.121		RATIO	28.816

Table S4 Benford's analysis of AQI in 2016

Digit	Count	Percent	Benford	Gap
1	16321	21.021	30.103	9.082
2	3771	4.857	17.609	12.752
3	6569	8.461	12.494	4.033
4	9374	12.074	9.691	-2.383
5	11475	14.78	7.918	-6.862
6	9837	12.67	6.695	-5.975
7	8160	10.51	5.799	-4.711
8	6716	8.65	5.115	-3.535
9	5400	6.955	4.576	-2.379
SUM	77623	100	100	0.004
K-S	0.128		RATIO	30.580

Table S5 Benford's analysis of AQI in 2017

Digit	Count	Percent	Benford	Gap
1	17665	22.822	30.103	7.281
2	3729	4.818	17.609	12.791
3	6619	8.551	12.494	3.943
4	9111	11.771	9.691	-2.08
5	10072	13.012	7.918	-5.094
6	9006	11.635	6.695	-4.94
7	8234	10.638	5.799	-4.839
8	6981	9.019	5.115	-3.904
9	5983	7.73	4.576	-3.154
SUM	77400	100	100	0.004
K-S	0.128		RATIO	30.536

Table S6 Benford's analysis of AQI in 2018

Digit	Count	Percent	Benford	Gap
1	1809	27.285	30.103	2.818
2	628	9.472	17.609	8.137
3	626	9.442	12.494	3.052
4	592	8.929	9.691	0.762
5	853	12.866	7.918	-4.948
6	695	10.483	6.695	-3.788
7	602	9.08	5.799	-3.281
8	439	6.621	5.115	-1.506
9	386	5.822	4.576	-1.246
SUM	6630	100	100	0.014
K-S	0.081		RATIO	5.656

Table S7 Benford's analysis of PM2.5 in 2013

Digit	Count	Percent	Benford	Gap
1	1195	35.534	30.103	-5.431
2	517	15.373	17.609	2.236
3	278	8.266	12.494	4.228
4	230	6.839	9.691	2.852
5	203	6.036	7.918	1.882
6	213	6.334	6.695	0.361
7	220	6.542	5.799	-0.743
8	239	7.107	5.115	-1.992
9	225	6.69	4.576	-2.114
SUM	3320	100	100	0.0202
K-S	0.054		RATIO	2.668

Table S8 Benford's analysis of PM2.5 in 2014

Digit	Count	Percent	Benford	Gap
1	10048	21.788	30.103	8.315
2	6588	14.285	17.609	3.324
3	6233	13.516	12.494	-1.022
4	5798	12.572	9.691	-2.881
5	5055	10.961	7.918	-3.043
6	4219	9.148	6.695	-2.453
7	3334	7.229	5.799	-1.43
8	2643	5.731	5.115	-0.616
9	2070	4.489	4.576	0.087
SUM	45988	100	100	0.005
K-S	0.083		RATIO	15.263

Table S9 Benford's analysis of PM2.5 in 2015

Digit	Count	Percent	Benford	Gap
1	16820	21.806	30.103	8.297
2	14161	18.359	17.609	-0.75
3	12032	15.599	12.494	-3.105
4	9929	12.872	9.691	-3.181
5	7776	10.081	7.918	-2.163
6	5948	7.711	6.695	-1.016
7	4353	5.643	5.799	0.156
8	3487	4.521	5.115	0.594
9	2616	3.391	4.576	1.185
SUM	77122	100	100	0.004
K-S	0.083		RATIO	19.765

Table S10 Benford's analysis of PM2.5 in 2016

Digit	Count	Percent	Benford	Gap
1	16972	21.86	30.103	8.243
2	15370	19.796	17.609	-2.187
3	13254	17.071	12.494	-4.577
4	9998	12.877	9.691	-3.186
5	7287	9.386	7.918	-1.468
6	5336	6.873	6.695	-0.178
7	3879	4.996	5.799	0.803
8	3278	4.222	5.115	0.893
9	2247	2.894	4.576	1.682
SUM	77621	100	100	0.004
K-S	0.082		RATIO	19.590

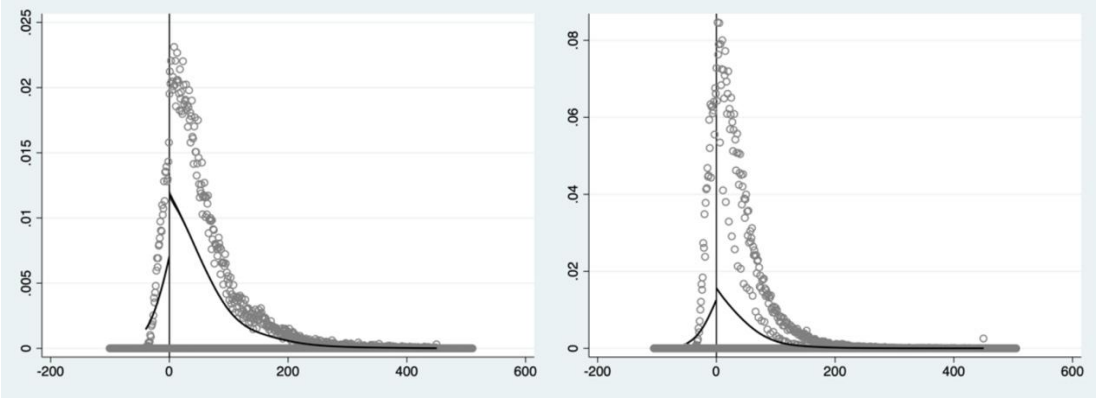
Table S11 Benford's analysis of PM2.5 in 2017

Digit	Count	Percent	Benford	Gap
1	17841	23.049	30.103	7.054
2	15317	19.788	17.609	-2.179
3	12336	15.937	12.494	-3.443
4	9838	12.71	9.691	-3.019
5	7233	9.344	7.918	-1.426
6	5210	6.731	6.695	-0.036
7	4011	5.182	5.799	0.617
8	3225	4.166	5.115	0.949
9	2386	3.083	4.576	1.493
SUM	77397	100	100	0.004
K-S	0.071		RATIO	16.938

Table S12 Benford's analysis of PM2.5 in 2018

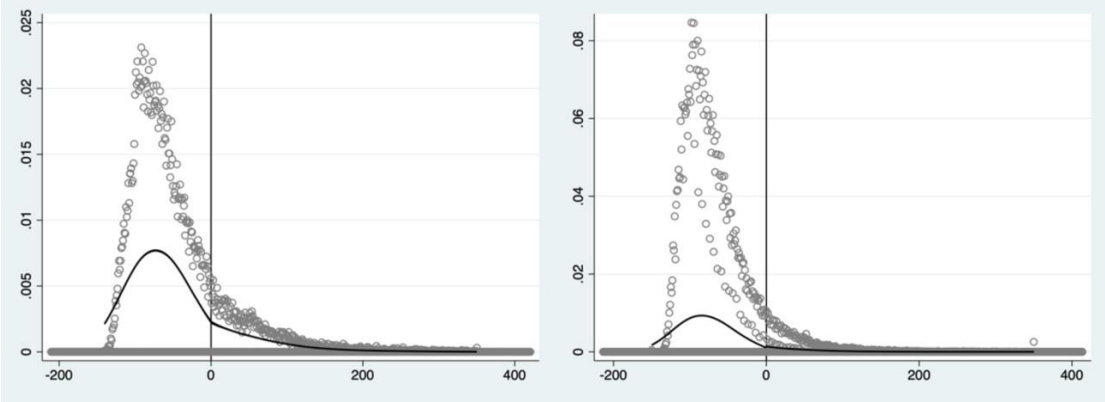
Digit	Count	Percent	Benford	Gap
1	1807	27.255	30.103	2.848
2	1082	16.32	17.609	1.289
3	811	12.232	12.494	0.262
4	654	9.864	9.691	-0.173
5	567	8.552	7.918	-0.634
6	495	7.466	6.695	-0.771
7	458	6.908	5.799	-1.109
8	431	6.501	5.115	-1.386
9	325	4.902	4.576	-0.326
SUM	6630	100	100	0.014
K-S	0.028		RATIO	1.955

Figure S9 McCracy test of AQI, taking 50 (excellent) as the Cut-off



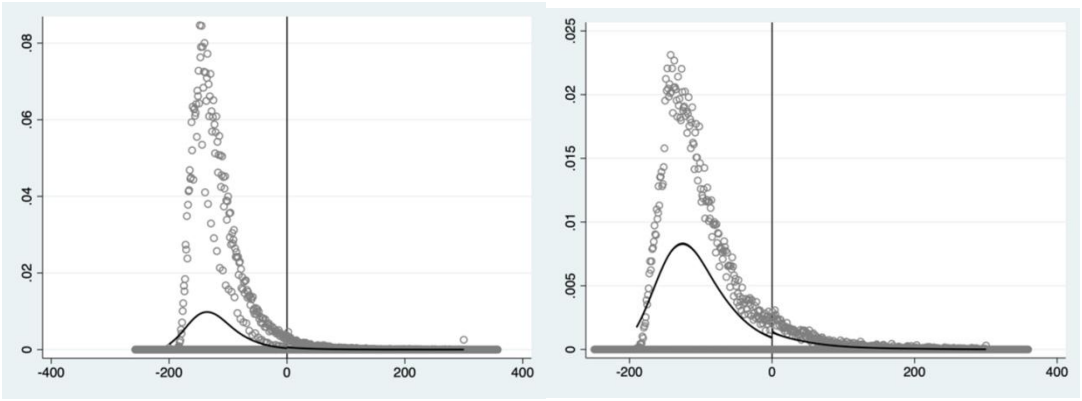
After 2th May,2015 Before 2th May,2015

Figure S10 McCracy test of AQI, taking 150 (lightly polluted) as the Cut-off



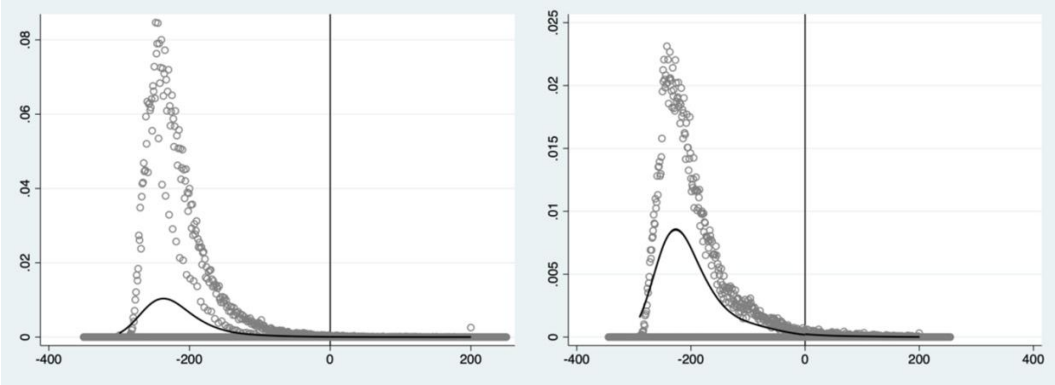
After 2th May,2015 Before 2th May,2015

Figure S11 McCracy test of AQI, taking 200 (medium polluted) as the Cut-off



After 2th May,2015 Before 2th May,2015

Figure S12 McCracy test of AQI, taking 300 (severe polluted) as the Cut-off



After 2th May,2015 Before 2th May,2015

Table S13 Placebo test of Density discontinuity test

Cut-off	Θ1	Θ2
5th February, 2015	(SE)	(SE)
	After	Before
	Local	Local
35	0.04	0.08
	(0.07)	(0.07)
75	-0.08	-0.06
	(0.10)	(0.07)

Table S14 Placebo test of Regression Discontinuity

Dependent Variable: Confidence in the presence of manipulation on PM2.5		
	(1)	(2)
Conventional	4.66	1.50
	(3.84)	(0.68)
Days of week	Y	Y
City-tier fixed	N	N
N	3713	5870
Kernel	Triangular	Triangular
After/Before	A	B
Cut-off	50	50