From air pollution governance to health and equity: evidence from China

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ONLINE APPENDIX

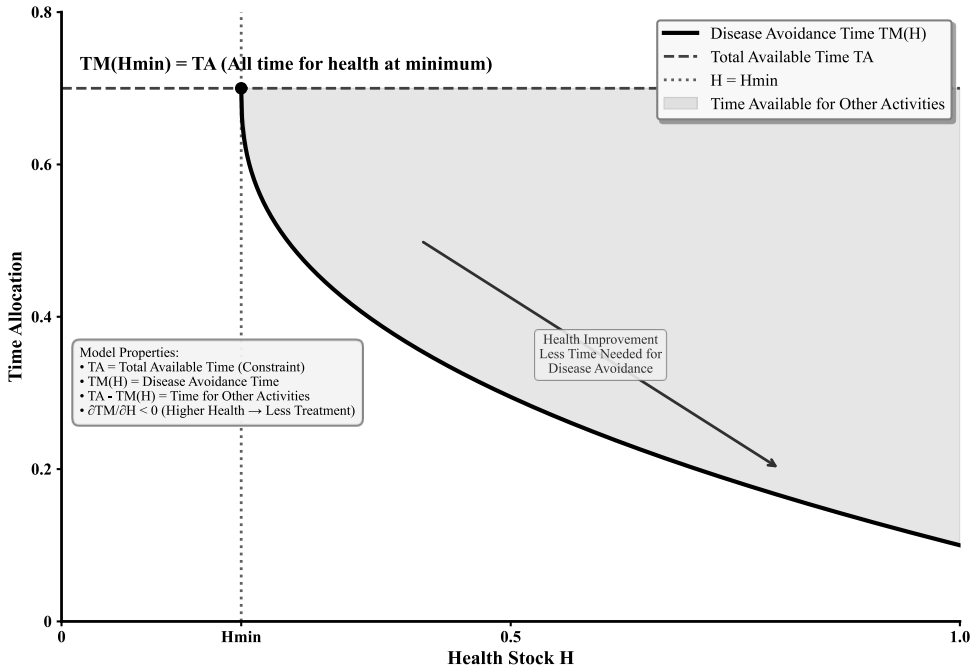

Figure A1. Disease avoidance function.

Calculation of air pollution governance

We utilize the weighted linear sum method, which is based on three air pollution governance indicators, the SDRR, ISDR and PMR, to construct the air pollution governance index. There are three specific steps. The first step is to combine the SDRR, ISDR and PMR, which are standardized separately:

$$PT_{i,j,t} = \frac{PT_{i,j,t} - min\left(PT_{i,j,t}\right)}{max\left(PT_{i,j,t}\right) - min\left(PT_{i,j,t}\right)}, \tag{A1}$$

where i, j and t represent the pollution control indicators, region and time, respectively; *max* and *min* represent the maximum and minimum values, respectively; and after Equation (A1), the standardized indicators belong to the interval [0,1].

The second step involves examining the disparities in emissions and economic development across various regions, as these disparities may influence regional environmental management initiatives. To mitigate the impact of these factors on the analysis presented in this

paper, the adjustment coefficient is computed:

$$Adjust_{i,j,t}=\frac{pollution_{i,j,t}\Big/\sum pollution_{j,t}}{GDP_{i,j,t}\Big/\sum GDP_{j,t}},$$

where *pollution* is the pollutant corresponding to the regional pollution control indicator; *GDP* is the gross domestic product of the region; and *Adjust* represents the ratio of the proportion of pollutants emitted by the region to the national pollutants and the proportion of the regional gross domestic product to the national gross domestic product. Considering that the pollutants emitted are related to GDP, when the relative pollutant emissions are relatively high and have the same pollution removal rate, it can be assumed that the region has a relatively strong level of air pollution governance (APG), so it is reasonable to adjust the level of regional APG by using a relatively large weight. The adjustment coefficient *Adjust* here is a value similar to the weights, which can take into account the link between the pollution emissions of the region and the GDP and make the APG indicators more accurate.

The third step is to sum the product of the standard values of the SDRR, ISDR and PMR, and the corresponding adjustment coefficients to obtain the city-level APG indicators:

$$APG_{i,j,t}=\frac{1}{3}\sum_{j=1}^{3} Adjust_{i,j,t}\times PT_{i,j,t}\,.$$

Among them, *APG* is the core variable of this paper, which represents the level of air pollution governance in the region.

Table A1. Descriptive statistics

Variable	*Explain*	*Mean*	*p50*	*SD*	*Min*	*Max*
APG	Degree of regional air pollution governance	1.073	0.989	0.699	0.110	3.776
Disease	Whether the population has d*isease*	0.197	0	0.397	0	1
HC	Health capital of the population	0.955	1	0.112	0	1
Year	Year of sample data	2009	2009	3.806	2004	2015
Age	Age of the population	46.84	48	12.80	19	69
Gender	Gender of the population	0.524	1	0.499	0	1
Illiterate	Whether the population is illiterate	0.126	0	0.332	0	1
Primary	Whether the population graduated from primary school	0.183	0	0.386	0	1
Middle	Whether the population has graduated from secondary school	0.545	1	0.498	0	1
Graduate	Whether the population has graduated from university	0.059	0	0.237	0	1
Urban	Whether the population's domicile is urban	0.664	1	0.472	0	1
Marriage	Whether the population is married	0.814	1	0.389	0	1
lnGDP	Logarithmic form of the GDP of the area in which the population live	16.16	16.15	0.930	14.07	18.79
lnHos_Num	Logarithmic form of the number of hospitals in the population's area	5.191	5.204	0.461	3.932	7.559
lnDoc_Num	Logarithmic form of the number of doctors in the population's area	8.904	8.855	0.583	7.358	10.39

Table A2. Further robustness tests

	(1)	(2)
Variable	*APG*	*Disease*
APG		-0.300
		(0.075)
ACC	-0.393	
	(0.034)	
L1. *FEPW*	0.409	
	(0.024)	
LM-Statistics	443.191	
F-Statistics	197.730	
Controls	Yes	Yes
ind-FE	Yes	Yes
year-FE	Yes	Yes
N	23726	23726

Note: Standard error statistics are in parentheses.

Table A3. Weight of calculating the health capital

Variable	FSC	Diarrhea	Stomachache	Asthma	HD	JMP
Weight	0.2805	0.0728	0.0728	0.0252	0.1545	0.1613
Variable	RD	EED	HCP	OID	OND	
Weight	0.0216	0.0341	0.0574	0.0286	0.1299	

Notes: FSC: Fever, sore throat, cough; HD: Headache, dizziness; JMP: Joint pain, muscle pain; RD: Rash, dermatitis; EED: Eye or ear disease; HCP: Heart disease/chest pain; OID: Other infectious disease; OND: Other noncommunicable disease.

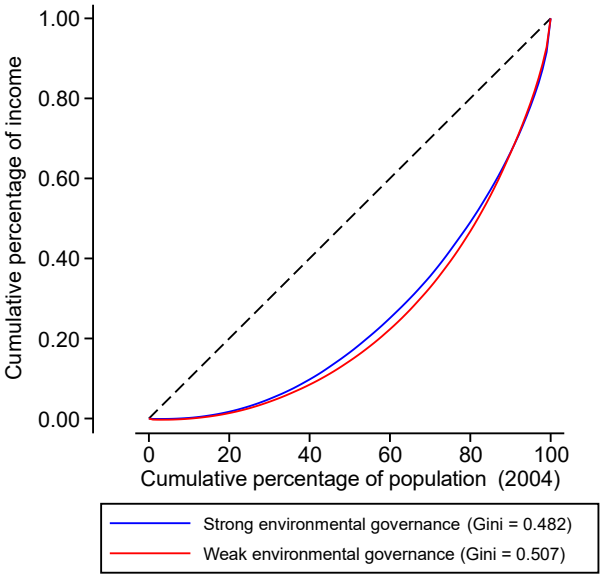

Figure A2. Lorenz curves of 2004.

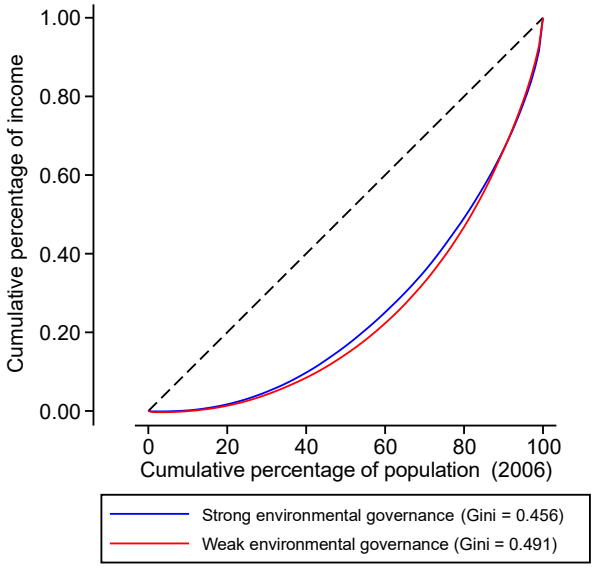

Figure A3. Lorenz curves of 2006.

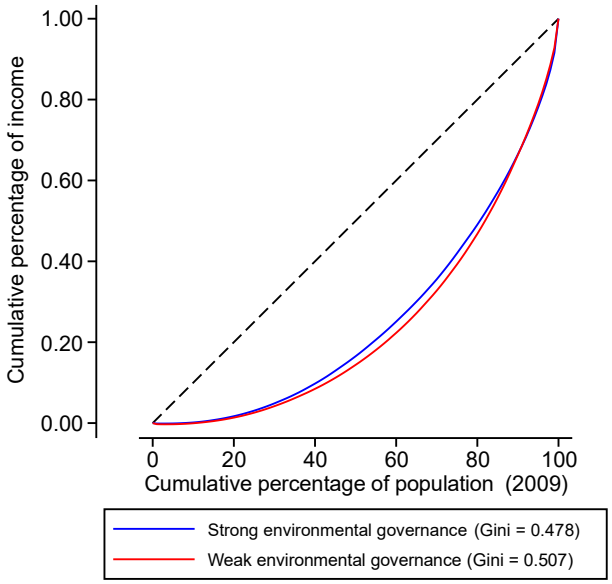

Figure A4. Lorenz curves of 2009.

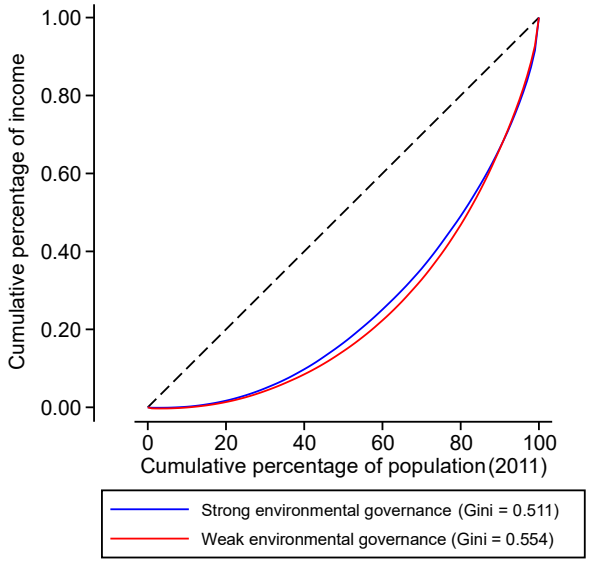

Figure A5. Lorenz curves of 2011.

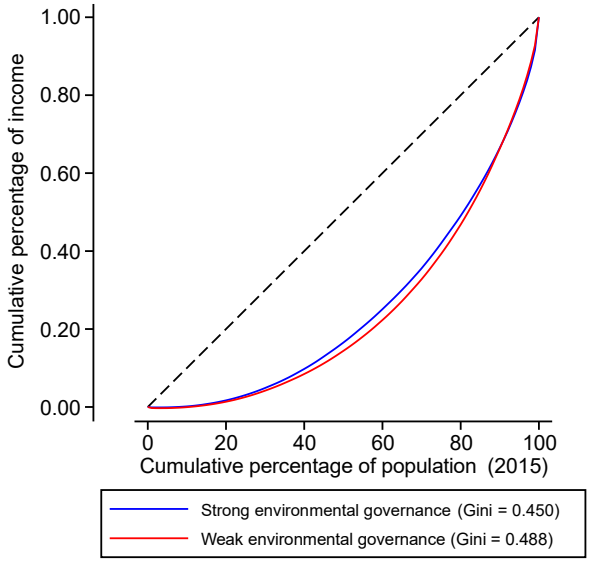

Figure A6. Lorenz curves of 2015.