Solid Waste Disposal and Its Relationship with Economic Development in Rural China

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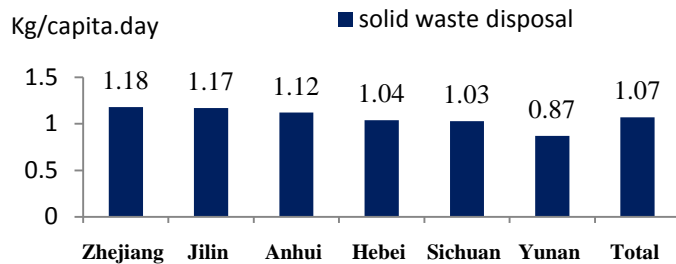
Research Questions

- Is there EKCrelationship between domestic solid waste discharge and per capita net income of farmers in rural China?
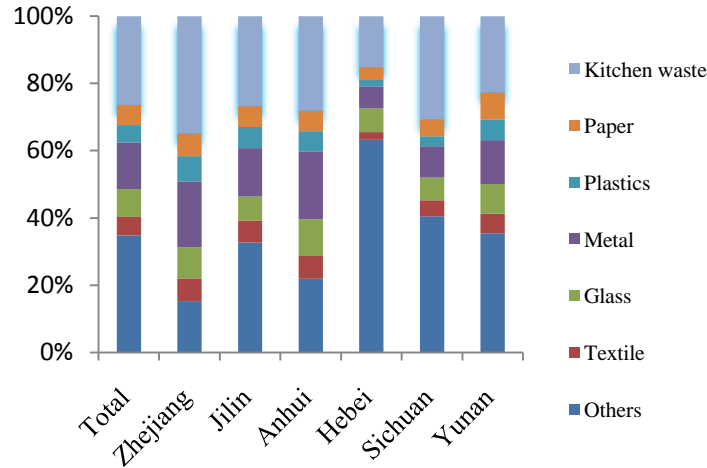- If yes, what is the turning point?

Methods and Data

Data come from a field surveyconducted in 2010, covered 1,118 farmers, and 18 counties in 6 provinces in China.

Solid waste disposal in rural China

Kg/capita.day — solid waste disposal

Zhejiang 1.18, Jilin 1.17, Anhui 1.12, Hebei 1.04, Sichuan 1.03, Yunan 0.87, Total 1.07
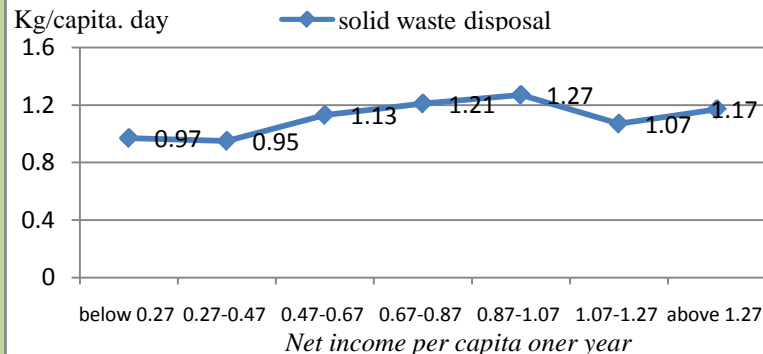
Domestic solid waste disposal is about 1.07 kg per capita per day in rural China and varies significantly across regions, from 0.87 to 1.18 kg/capita per day

Composition of solid waste in rural China

Legend: Kitchen waste, Paper, Plastics, Metal, Glass, Textile, Others

Categories: Total, Zhejiang, Jilin, Anhui, Hebei, Sichuan, Yunan

- Kitchen waste is the most important waste of rural domestic solid waste, whose proportion is 27.6%
- There is also regional difference between different types of domestic solid waste.

Relationship between net income and solid waste disposal

Kg/capita. day — solid waste disposal

Values: 0.97, 0.95, 1.13, 1.21, 1.27, 1.07, 1.17

x-axis: below 0.27, 0.27-0.47, 0.47-0.67, 0.67-0.87, 0.87-1.07, 1.07-1.27, above 1.27

Net income per capita oner year

The relationship between the solid waste disposal per capita of rural domestic solid wastes and income per capita shows an obvious inverted U-shaped curve, and the turning point comes between 0.87~1.07 10^4 RMB net income per capita

Econometric Model Specification

$$\ln(y_i) = \alpha_1 + \beta_1 I_i + \beta_2 I_i^2 + \beta_3 Z_i + \varepsilon_i$$

y_i denotes the ith household daily solid waste disposal, I_i is the net income (10^4rmb/capita), and I_i^2 is the quadratic item of net income; Z_i is a vector of control variables.

Estimation Results

Estimation results of key variables:

	Per capita solid waste disposal (kg/day)
Net income per capita ($10^{4/}$capita)	0.321
	(2.78)***
Square of net income per capita	-0.092
	(1.93)*
Turning point	**17446 RMB**
Observation	1, 118

Notes: t-value in parentheses; * p<.1, ** p<.05, *** p<.01

The environmental Kuznets curve is empirically found for solid waste disposal. The turning point of estimated per capita net income is about 17446 RMB a year

Conclusions and Political Implication

- Domestic solid waste disposal per capita is about 1.07 kg/day. Therefore, the government should strengthen rural solid waste management without delay.
- Domestic solid waste in rural China varies not just throughoutregions, but also between different components. Consequently, the government should introduce different policies in different regions.
- The environmental Kuznets curve is empirically found for solid waste disposal in rural China. The turning point of estimated per capita net income is about 17446 RMBayear. Using anypolicyandmarketing instruments which could significantly increase the recycling rate of these wastes are necessary.