Lowering Down Tax Policy of Small Units: Unintended Effects on Divorce Rates

MA Thesis Workshop: Presentation 2

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Research Question

- This research investigates the impact of a China's size based real estate policy (lowering down tax of small unit houses) on divorce, using a Regression Discounity (RD) method.

Regulations on Housing Issued in 2010: Tax Rate Discontinuity

- Lowered the percentage of the down payment for purchasing units with floor areas less than or equal to $90m^2$ to 20%, while the down payment for others remained at 30%.
- Lowered property deed taxes for purchasing housing units with floor areas less than or equal to $90m^2$ from 3% to 1%.

Policy Analysis and Sharp RD

Intuition: Policy Leads to Household Value Increment

- Tax reduction lowered the cost of selling smaller houses, thereby increased current market value through discounted cash flow. Hence, smaller houses owners experience a wealth increase.

This research regards the policy as a sharp RD design (the policy impacts all homeowners with properties $\leq 90m^2$).

- For individuals intending to sell their houses, even if some were unaware, they would still be affected by the policy when they sell.
- For individuals who do not plan to sell, the self-reported house values in the survey reflects the policy's impact, as information of house value from neighbors is a common practice in China, allowing them to observe the increase in value of nearby houses that are sold.

Data Cleansing

China Family Panel Studies (CFPS) is a nationally representative, biennial longitudinal general social survey project, launched in 2010.
The sample in this research only contains people who married before 2010 and has at least partial ownership of the house.

Indicators are created as follows:

- Divorce: $\begin{cases} 1, & \text{if the individual ever divorced once from 2010 to 2020} \\ 0, & \text{otherwise} \end{cases}$
- Ownership: $\begin{cases} 1, & \text{if the couple has full ownership of the house} \\ 0, & \text{if the couple has partial ownership of the house} \end{cases}$
- D: $\begin{cases} 1, & \text{for houses with area } \leq 90 \text{ m}^2 \\ 0, & \text{otherwise} \end{cases}$

Summary Statistics

Variable	# of Obs	Mean	S.D.
Panel A: House Characteristics			
Area (m^2)	8,101	101.40	43.80
D ($\leq 90m^2$)	8,101	0.48	0.50
Ownership	8,101	0.97	0.17
Panel B: Individual Characteristics			
Gender	8,101	0.49	0.50
Divorce	8,101	0.02	0.14

Table: Summary Statistics (Weighted)

- About 2% of individuals in the sample have divorced.
- 52% of the houses in the sample are small (area $< 90m^2$).
- 97% of the people in the sample have full house ownership.

Estimation: Policy's Effect on Divorce Rate

Equation of Interest (Revised): Sharp RD

$$Y_{it} = \alpha + \beta \cdot D\left[\text{HouseSize}_{it} < 90\right] + f\left(\text{HouseSize}_{it} - 90\right) + 1\left[\text{HouseSize}_{it} < 90\right] \cdot g\left(\text{HouseSize}_{it} - 90\right) + X_{it}\theta + \epsilon_{it}$$

where

- Y_{it} is the outcome variable for household i in year t, such as the divorce rate or family stability indicator.
- HouseSize_{it} is the running variable: the size of the house purchased by household i.
- $D\left[\text{HouseSize}_{it} < 90\right]$ is an indicator dummy variable that equals 1 if the house size is below $90m^2$, and 0 otherwise.
- $f\left(\text{HouseSize}_{it} - 90\right)$ and $g\left(\text{HouseSize}_{it} - 90\right)$ are flexible functions of the house size relative to the cutoff (not necessarily the same)

RD Plot: Fitted with Polynomials

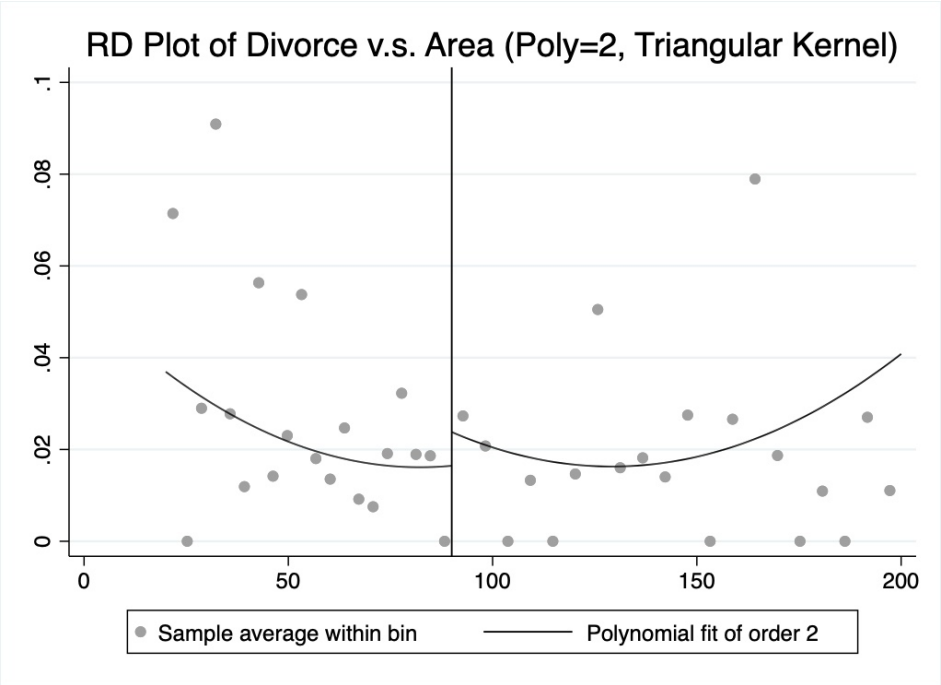

Figure: RD Plot of Divorce vs. Area (Polynomial of Order 2, Triangular Kernel)

- The policy increased the value of smaller homes and contributed to greater marital stability for couples in these properties.
- Higher average divorce probability for couples with houses above $90m^2$: clear discontinuity at the $90m^2$ cutoff suggests that the imapct come from the policy rather than the area size.

RD Regression: Fitted with Polynomials

	Divorce	
D	0.01	0.01
	(0.01)	(0.01)
area_poly	0.00	0.00
	(0.00)	(0.00)
D_area_poly1	0.00	0.00
	(0.00)	(0.00)
D_area_poly2	0.00**	0.00***
	(0.00)	(0.00)
Constant	0.02***	-0.19
	(0.01)	(0.31)
Fixed Effects (FEs)	N	Y
Observations	8,101	8,101

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
FEs include: House type fixed effects, household type fixed effects, province fixed effects, ownership fixed effects.

Table: Sharp RD Estimates with Polynomials

RD Regression: Not Fitted with Polynomials

	h=5	h=10	h=15
RD_Estimate	0.03***	0.02**	0.01
	(0.01)	(0.01)	(0.01)
Observations	537	932	2382

Table: Sharp RD Estimates with Bandwidth and without Polynomials

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Bandwidths of 5 and 10 suggest that the estimated positive impact is stable around the cutoff.
- The positive effect on divorce probability is not highly sensitive to the bandwidth, supporting the reliability of the observed relationship at the cutoff.

Mechanism

Value (10,000 RMB = 1,477 USD) per Square Meter (m^2)					
	(1)	(2)	(3)	(4)	(5)
D	0.34	0.41*	0.60**	0.61***	0.63***
	(0.22)	(0.23)	(0.23)	(0.23)	(0.24)
Year Moved In		0.00	0.01	0.01	0.01
		(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.30**	-8.06	-20.78	-24.16	-25.70
	(0.15)	(21.30)	(21.35)	(21.40)	(21.73)
House Type FE	N	Y	Y	Y	Y
Household Type FE	N	N	Y	Y	Y
Province FE	N	N	N	Y	Y
Ownership FE	N	N	N	N	Y
Observations	8,101	8,101	8,101	8,101	8,101

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table: Policy Impact on Value per Area, in 10,000 RMB

Nest Steps

- Conduct balance tests across groups to ensure comparability, especially by examining different bandwidths and different polynomials.
- Build theoretical framework to explain the mechanism.
- Conduct robustness checks, such as sensitivity analyses with various bandwidths, and alternative functional forms of f and g.
- Refer to previous literature (Imbens and Kalyanaraman, 2011) to determine the optimal bandwidth.