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Land Reform and Child Nutrition: Evidence from Kyrgyzstan

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Research Question

- Does privatizing land improve child health and nutrition outcomes in Central Asia?



Context

- Natural experiment in Kyrgyzstan in the early 1990s (peaking during 1994 – 1995): Government rapidly liquidated state and collective farms (75% of agricultural land) and distributed land to individuals (with 99-year transferrable use rights)
 - We refer to this as land privatization, as it initiated the process of allowing private land ownership
 - 1998: constitutional amendment allows private land ownership, and all land use certificates transformed into land ownership certificates (USAID 2011)

Main Findings

- Children exposed to privatization for longer periods of time accumulated significantly greater gains in height and weight, both critical measures of long-term health and nutrition
- Health benefits appear only after age 1, and are largest for those 13-18 months old
 - Possibly due to protective effects of breastfeeding for very young children and reduced vulnerability to health shocks for older children
- Similar impacts for both genders
- Availability of land itself does not appear to explain health benefits; appear to come from other sources such as tenure security/ ability to use land as collateral/ rent it, etc.

Motivation

- In theory, markets should provide land to the most productive individuals, thus maximizing social welfare.
- Relatedly: Secure land tenure spurs productive investments
 - Besley, 1995; Carter and Olinto, 2003; Lopez and Roman, 1997; Alston et al., 1999; Banerjee et al., 2002; Lanjouw and Levy, 2002; Field, 2005; Deininger and Ali, 2008
- But: historical inequalities, credit constraints, and cultural norms may pose barriers to accessing natural resources for otherwise productive individuals
- Also, there are costs of private ownership (to demarcate/ delineate plots, establish and maintain records, enforce rights/ resolve disputes
 - Feder and Feeney 1991; DeMeza and Gould 1992; Deininger and Feder 2001

Motivation (continued...)

- Young children (under age 5) are especially sensitive to investments made in their health; children under age 2 are even more sensitive
- How land is accessed (amount, security of tenure, ability to use as collateral or lease out, etc.) may affect inputs into child health by affecting:
 - Overall income, including from agriculture and non-ag sources
 - Availability of food
 - Diversity of food available and consumption of micronutrients
 - Time spent with children
- Lots of analysis of the economic impacts of land reform (including on farm level decision-making, productivity, and rural incomes) but less on health impacts

Background: Land Reform

- 1991: independence from Soviet Union
- Starting in early 1990s (peaking during 1994 – 1995): Government rapidly liquidated state and collective farms (75% of agricultural land) and distributed land to individuals (with 99-year transferrable use rights)
- 1998: constitutional amendment allows private land ownership, and all land use certificates transformed into land ownership certificates (USAID 2011)
- Contrasts with land ownership and usage systems in other Central Asian countries with more government involvement

Data: 1993, 1996, 1997, 1998 Kyrgyz Rep. LSMS

- Four repeated cross-sections
- Roughly the same sampling methodology, geographic coverage, and questions about outcomes of interest/ controls
- Data span the critical period during which land privatization occurred
- Our outcomes are the three most commonly used anthropometric indices used for children:
 - height-for-age z-scores (measure of stunting & long-term health/ nutrition)
 - weight-for-height z-scores (measure of wasting)
 - weight-for-age z-scores (measure of long-term health/ nutrition)

Data: 2016 Life in Kyrgyzstan Survey (LIKS)

- Community survey (9 to 51 per oblast) asks: “In the 1990s, a large-scale land reform occurred in Kyrgyzstan that allocated land plots to households. When did the land reform first allocate plots of land in your community (month and year)?”
 - We assign the median date reported (month/ year) in each oblast as the date of reform

Oblast	Date of reform.
Batken	Jan-96
Chui	Dec-94
Issyk-Kul	Feb-95
Jalal-Abad	Mar-94
Naryn	Sep-92
Osh	May-94
Talas	Mar-94

Primary Empirical Specification

$$Y_{iahjt} = \beta_0 + \beta_1 P_{iahjt} + \beta_2 X_{hjt} + \delta_a + \alpha_j + \gamma_t + \varepsilon_{iahjt}$$

where:

- Y_{iahjt} is a health/ nutrition outcome for child i whose age in months is a from household h living in oblast j in year t .
- P_{iahjt} captures the number of months a child has been exposed to land privatization
- δ_a are child age in months fixed effects
- α_j are oblast fixed effects
- γ_t are survey year fixed effects.
- X_{hjt} are household head controls (age, gender, marital status, ethnicity)
- t is the survey year

Critical Periods Empirical Specification

$$Y_{iahjt} = \beta_0 + \beta_1 P_{iahjt}^{0t6} + \beta_2 P_{iahjt}^{7t12} + \beta_3 P_{iahjt}^{13t18} + \beta_4 P_{iahjt}^{19t24} + \beta_5 P_{iahjt}^{25t60} + \beta_6 X_{hjt} + \delta_a + \alpha_j + \gamma_t + \varepsilon_{iahjt}$$

where:

- P_{iahjt}^{atb} is the number of months a child was exposed to land privatization between the ages of a and b months old
- The coefficients on the exposure variables thus represent the effect of an additional month of exposure to privatization on child health and nutrition outcomes during the corresponding period in the child's development.

Land Privatization Improves Long-term Health and Nutrition

Dependent variable:	Panel A: Height-for-age Z-score			Panel B: Weight-for-height Z-score			Panel C: Weight-for-age Z-score		
	All	0-24m	25-60m	All	0-24m	25-60m	All	0-24m	25-60m
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Exposed	0.041*** (0.01)	0.167*** (0.04)	0.018 (0.01)	0.011 (0.01)	-0.019 (0.03)	0.019* (0.01)	0.035*** (0.01)	0.109*** (0.03)	0.01 (0.01)
Female	0.199* (0.10)	0.506** (0.21)	0.067 (0.07)	-0.076 (0.06)	0 (0.13)	-0.084 (0.06)	0.068 (0.08)	0.248* (0.11)	0.012 (0.08)
N	3261	1022	2239	3005	992	2013	3799	1240	2559
R squared	0.13	0.21	0.08	0.04	0.04	0.05	0.08	0.14	0.05

Source: LSMS 1993, 1996, 1997 and 1998 data (World Bank) and 2016 Life in Kyrgyzstan survey.

Notes: These are OLS regressions. The sample includes children aged 0-60 months old at the time of the survey. The regressions are estimated for children who live in rural areas. "Exposed" is the number of months a child was alive during the land reform. All regressions include survey year fixed effects, oblast fixed effects, child age in months fixed effects, and controls for household head: age, gender, a dummy for being married; and ethnicity. Standard errors are clustered at the year of child birth level and appear in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Children Benefit Most After Turning One

	All	0-24m	25-60m
	(1)	(2)	(3)
Months exposed between 0-6 months of age	-0.041*	-0.082	-0.034
	(0.02)	(0.08)	(0.03)
Months exposed between 7 & 12 months of age	0.016	-0.190*	-0.03
	(0.05)	(0.09)	(0.06)
Months exposed between 13 & 18 months of age	0.120**	0.584***	0.057
	(0.05)	(0.15)	(0.06)
Months exposed between 19 & 24 months of age	-0.041	-0.255	-0.016
	(0.03)	(0.13)	(0.05)
Months exposed between 25 and 60 months of age	0.028*		0.025***
	(0.01)		(0.01)
Female	0.196*	0.492*	0.069
	(0.09)	(0.21)	(0.06)
N	3315	1025	2290
R squared	0.12	0.22	0.08

Girls and Boys Receive Similar Benefits

	All	0-24m	25-60m
	(1)	(2)	(3)
Exposed	0.043***	0.172***	0.015
	(0.01)	(0.04)	(0.01)
Exposed × Female	-0.003	-0.012	0.006
	(0.01)	(0.02)	(0.01)
Female	0.266*	0.634**	-0.109
	(0.15)	(0.29)	(0.19)
N	3261	1022	2239
R squared	0.13	0.22	0.08

Source: LSMS 1993, 1996, 1997 and 1998 data (World Bank) and 2016 Life in Kyrgyzstan survey.

Notes: These are OLS regressions. The sample includes children aged 0-60 months old at the time of the survey. The regressions are estimated for children who live in rural areas. “Exposed” is the number of months a child was alive during the land reform. All regressions include survey year fixed effects, oblast fixed effects, child age in months fixed effects, and controls for household head: age, gender, a dummy for being married; and ethnicity. Standard errors are clustered at the year of child birth level and appear in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Access to Land Itself Does Not Explain Health Improvements

	All	0-24m	25-60m
	(1)	(2)	(3)
Exposed	0.043***	0.171***	0.018
	(0.01)	(0.04)	(0.01)
Female	0.187**	0.480***	0.061
	(0.08)	(0.16)	(0.09)
HH has land available	-0.484***	-0.696**	-0.378**
	(0.15)	(0.33)	(0.16)
Hectares of land available	0.013***	0.008	0.016***
	(0.00)	(0.01)	(0.00)
N	3241	1016	2225
R squared	0.13	0.22	0.09

Source: LSMS 1993, 1996, 1997 and 1998 data (World Bank) and 2016 Life in Kyrgyzstan survey.

Notes: These are OLS regressions. The sample includes children aged 0-60 months old at the time of the survey. The regressions are estimated for children who live in rural areas. "Exposed" is the number of months a child was alive during the land reform. All regressions include survey year fixed effects, oblast fixed effects, child age in months fixed effects, and controls for household head: age, gender, a dummy for being married; and ethnicity. Standard errors are clustered at the year of child birth level and appear in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Conclusions

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Спасибо

Thank you