

TABLE III
LAND REFORM AND POVERTY IN INDIA: BASIC RESULTS

	Rural poverty gap	Rural poverty gap	Rural poverty gap	Rural head count	Urban poverty gap	Poverty gap difference	Poverty gap difference	Head- count difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Model	GLS AR(1)	GLS AR(1)	GLS AR(1)	GLS AR(1)	GLS AR(1)	GLS AR(1)	GLS AR(1)	GLS AR(1)
Four-year lagged cumulative land reform legislation	-0.281 (2.18)	-0.443 (3.21)			0.085 (1.05)	-0.534 (5.24)		
Four-year lagged cumulative tenancy reform legislation			-0.604 (2.52)	-1.378 (3.13)			-0.736 (3.27)	-1.916 (4.37)
Four-year lagged cumulative abolition of intermediaries legislation			-2.165 (4.08)	-4.354 (4.11)			-1.327 (2.59)	-3.364 (3.73)
Four-year lagged cumulative land ceiling legislation			0.089 (0.11)	0.734 (0.86)			0.230 (0.61)	0.888 (1.14)
Four-year lagged cumulative land consolidation legislation			0.456 (0.82)	-0.208 (0.19)			-0.210 (0.42)	-1.737 (1.62)
State effects	YES	YES	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES	YES	YES
Number obser- vations	507	300	507	507	507	507	507	507

z-statistics are in parentheses. See the Data Appendix for details on construction and sources of the variables. The data are for the sixteen main states. We use data 1961-1992 for fourteen states. For Haryana which split from the Punjab in 1965, we use data 1965-1995 and for Jammu and Kashmir we use data 1961-1991 as there was no NSS survey in 1992. This gives us a sample size of 507. The sample size in column (2) is smaller as it is only run for years when NSS surveys were carried out. Poverty measures in other regressions have been interpolated between survey years. The GLS AR(1) model allows a state-specific AR(1) process—see equation (1) in the text for details. In columns (6) and (7) the poverty gap difference is the difference between the rural and urban poverty gap. In column (5) the headcount difference is the difference between the rural and urban head-count index.

TABLE 5
EFFECT OF REGISTRATION ON THE LOG OF RICE YIELD IN WEST BENGAL, 1979-93
(N=210)

	Model 1 (1)	Model 2 (2)	Model 3 (3)	Model 4 (4)	Model 5 (5)	Model 6 (6)
Sharecropper registration (one year lagged)	.43*** (3.46)	.42*** (3.44)	.43*** (3.55)	.35*** (2.69)	.36*** (2.64)	.36*** (2.63)
Log(rainfall)	...	-.07* (-1.67)	-.08* (-1.82)	-.07 (-1.59)	-.08* (-1.74)	-.08* (-1.77)
Log(public irrigation)	...	.02 (1.01)	.01 (.70)	.01 (.60)	.02 (.83)	.02 (.79)
Log(roads)	...	.28*** (2.75)	.25** (2.46)	.21** (1.99)	.19 (1.55)	.22 (1.54)
HYV share of rice area	...	...	.57*** (2.85)	.45** (2.10)	.47** (2.16)	.47** (2.16)
F-statistic:						
South × year ^a	...	...	...	4.73***	4.36***	4.38***
Left Front × year ^b	...	...	...	...	2.64**	2.65**
Sharecropping × year ^c	...	...	...	...	2.64**	.12
District fixed effects	72.23***	15.10***	8.99***	9.01***	8.47***	7.68***
Year fixed effects	28.31***	27.67***	21.60***	17.63***	17.83***	12.17***
R ²	.91	.92	.92	.92	.92	.92

NOTE.—t-statistics are in parentheses.

^a Represents a set of variables obtained by interacting a dummy variable that takes the value one if that district is in southern West Bengal with each year.

^b Represents a set of variables obtained by interacting a dummy variable that takes the value one if that district had a Left Front majority at the local-level government in 1977 with each year.

^c Represents a set of variables obtained by interacting the initial extent of sharecropping in a district with each year.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

TABLE 6
EFFECT OF REGISTRATION ON THE LOG OF RICE YIELD IN WEST BENGAL, 1979-87
(*N*=126)

	Model 1a	Model 1b	Model 2a	Model 2b	Model 3a	Model 3b
Sharecropper registration	.44*** (2.71)	.46*** (2.73)	.46*** (2.41)	.48*** (2.89)	.40** (2.34)	.41** (2.29)
Log(real wages)	...	.11 (1.07)	...	.05 (.55)	...	.03 (.31)
Log(price of rice)	...	-.11 (-.98)	...	-.04 (-.40)	...	.001 (.01)
Log(rainfall)	...	...	-.08* (-1.65)	-.08 (-1.52)	-.08 (-1.45)	-.08 (-1.41)
Log(public irrigation)	...	...	.10** (2.34)	.09** (2.30)	.09** (2.19)	.09** (2.14)
Log(roads)	...	...	.10 (.82)	.10 (.78)	.08 (.47)	.08 (.50)
HYV share of rice area	...	...	.66** (2.14)	.59* (1.77)	.49 (1.45)	.47 (1.34)
<i>F</i> statistic:						
South × year	...	...	...	...	yes	yes
Left Front × year	...	...	...	...	yes	yes
Sharecropping × year	...	...	...	...	yes	yes
District fixed effects	40.93***	29.34***	6.08***	10.20***	4.51**	3.98**
Year fixed effects	24.39***	20.20***	17.71***	4.36**	14.12***	11.29***
<i>R</i> ²	.89	.89	.90	.90	.90	.90

NOTE.—*t*-statistics are in parentheses.
* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Table 4: Total Household Weekly Hours in Labor Force

	(1)	(2)	(3)	(4)	(5)
<i>(N=2379)</i>	<i>(all regressions include demographic controls, city*program years, and city*initial rights)</i>				<i>no demog. controls</i>
Number working-age members	12.03 (3.37)**	12.10 (3.37)**	12.16 (3.36)**	9.25 (6.45)	18.83 (4.934)**
Squatter*program	13.45 (6.49)*	-12.76 (12.12)	9.63 (16.69)	58.33 (26.04)*	55.10 (27.19)*
Squatter*program periods		14.5 (5.82)*	15.3 (5.72)**	16.4 (5.37)**	17.3 (6.02)**
Squatter*program* tenure			-1.17 (0.57)*	-1.12 (0.56)*	-1.07 (0.62)
Squatter*program* working-age members				-29.09 (11.66)*	-27.85 (11.89)*
(Squatter*program* working-age members) ²				3.39 (1.31)*	3.13 (1.36)*
<hr/>					
<i>Implied program effect:[†]</i> <i>N=4, T=15</i>	<i>13.45</i> <i>(6.49)*</i>	<i>16.20</i> <i>(6.55)**</i>	<i>22.58</i> <i>(7.03)**</i>	<i>12.27</i> <i>(7.98)</i>	<i>12.20</i> <i>(8.65)</i>
<i>Implied program effect:</i> <i>N=3, T=15</i>				<i>17.64</i> <i>(6.47)**</i>	<i>18.13</i> <i>(7.04)*</i>
<i>Implied program effect:</i> <i>N=3, T=10</i>			<i>28.43</i> <i>(8.48)**</i>	<i>23.23</i> <i>(7.97)**</i>	<i>23.51</i> <i>(8.52)**</i>

[†] Implied program effect evaluated at N number of working age HH members, T years of residential tenure and median number of program periods (2).

* Significant at the 0.05% level. ** Significant at the 0.01% level.

Notes: OLS regression, dependent variable is HH total weekly work hours. Standard errors in parentheses. All regressions control for city, size of property and residential tenure of HH. In addition, columns 3-5 include all relevant intermediate interactions of HH tenure and size. Robust standard errors account for sample clustering and stratification. Ineligible HHs (residential tenure pre-1995) and HHs with missing hours or days values for working members are excluded. Demographic controls include: sex, age, literacy and degree level of HH head; # HH members, # of school-age children, # of babies, fraction male, fraction immigrants, and # members 70 and older; whether indoor plumbing, whether property acquired by invasion, and whether inherited lot; whether dwelling lies within walking distance and this indicator interacted with walking time to nearest primary school, secondary school, bus stop, public phone, and public market; and whether neighborhood has local bus stop/market/public phone/primary and secondary school currently and for the last two years, and whether neighborhood has school, child, food or general social assistance program.

Table 8: Whether any Household Member Age 5-16 Works

	(1)	(2)	(3)
	<i>All households with children ages 5-16</i>		<i>Households with <6 members</i>
	<i>(N=1557)</i>		<i>(N=1250)</i>
Number boys age 12-16	0.301 (0.157)	0.315 (0.157)*	0.582 (0.215)**
Number girls age 12-16	0.145 (0.160)	0.151 (0.160)	0.144 (0.203)
Number children age 5-11	-0.026 (0.124)	-0.024 (0.124)	0.006 (0.155)
Squatter*program	-0.196 (0.276)	-1.541 (0.619)*	-0.602 (0.300)*
Squatter*program* working-age members		0.280 (0.120)*	
<hr/>			
<i>Mean program effect on HH with 3 potential workers</i>	<i>-0.196</i>	<i>-0.700</i>	<i>-0.602</i>
<i>SE</i>	<i>(0.27)</i>	<i>(0.34)*</i>	<i>(0.30)*</i>
<i>Marginal effect</i>	<i>-0.015</i>	<i>-0.024</i>	<i>-0.022</i>

* Significant at the 0.05% level. ** Significant at the 0.01% level.

Notes: Binomial probit estimation, dependent variable is a dummy indicator of whether HH members ages 5-16 report working more than 5 hours/week. Standard errors are in parentheses. All regressions control for city, size of property and residential tenure of HH. In addition, columns a and b include all relevant intermediate interactions of HH tenure and size. Robust standard errors account for sample clustering and stratification. Ineligible HHs (residential tenure pre-1995) and HHs with missing hours or days worked values for working members are excluded.

Demographic controls include: sex, age, literacy and degree level of HH head; # HH members, # of school-age children, # of babies, fraction male (of working-age members), fraction immigrants, and # members 70 and older; whether indoor plumbing, whether property acquired by invasion, and whether inherited lot; whether dwelling lies within walking distance and this indicator interacted with walking time to nearest primary school, secondary school, bus stop, public phone, and public market; and whether neighborhood has local bus stop/market/public phone/primary and secondary school currently and for the last two years, and whether neighborhood has school, child, food or general social assistance program.

Table 7: OLS Regressions, Credit Supply

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable:</i>	Offered given applied		Interest rate offered		Amount received		Difference b/t amount asked and received	
<u>Materials Bank loans</u>								
COFOPRI title	0.046** (0.010)	0.012 (0.030)	-0.010 (0.015)	-0.015 (0.019)	-216.26 (219.05)	-113.14 (307.40)	399.59 (480.49)	-215.51 (470.70)
Property documents required*COFOPRI title		0.057** (0.024)		0.011 (0.022)		-325.03 (403.03)		1342.86 (992.63)
<u>Other formal loans</u>								
COFOPRI title	0.002 (0.061)	0.000 (0.017)	-0.085* (0.041)	-0.102* (0.048)	-25.83 (684.69)	614.71 (715.37)	54.02 (119.31)	247.82 (192.12)
Property documents required*COFOPRI title		-0.062 (0.082)		0.038 (0.063)		-1435.43 (1107.56)		-434.31 (260.27)
<u>Supplier loans</u>								
COFOPRI title	0.000 (0.000)	0.000 (0.000)	-0.008 (0.014)	-0.006 (0.013)	110.35 (100.57)	106.50 (102.35)	0.128 (0.304)	0.084 (0.309)
Property documents required*COFOPRI title		0.000 (0.000)		-0.014 (0.147)		192.87 (858.88)		2.210 (2.59)

Notes: First two columns are probit estimates, all remaining are OLS regressions. Standard errors are in parentheses. Robust standard errors account for sample clustering and stratification.

Demographic controls include: age, literacy, and degree level of HH head; whether residence used as source of economic activity, total monthly household wage income, monthly earnings of highest wage earner, whether highest wage earner self-employed, whether worker with greatest work hours self-employed, monthly earnings of highest contracted employee, and fraction of household wages from contracted employment; self-reported sale value and age of property, whether household is engaged in entrepreneurial activity, monthly income from household entrepreneurial activity, whether business has a registered tax number, whether household rents part of residence, and total amount of other outstanding formal debt between 1997 and 1999; whether or not paid any electricity, water or phone bill last month and amounts paid for each; whether household member belongs to local financial group, number of adults, and dummy indicating household has an additional type of unregistered property document; whether economic shock over past year, whether applied previously for a loan from the same category of institution, year of the loan application, intended use of loan funds and distance from the lender.

Table 2: Base results

	1 profit x1000 cedis/hectare	2 yield x1000 cedis/hectare	3 labor cost x1000 cedis/hectare	4 seed cost x1000 cedis/hectare
gender: 1=woman	-1,043.43 [472.73]	-1,497.18 [561.54]	-262.71 [276.17]	-91.22 [125.70]
hectare decile=2	446.64 [576.66]	-775.44 [684.99]	-1,313.13 [336.89]	-244.97 [184.37]
hectare decile=3	1,039.18 [595.48]	-793.74 [707.34]	-1,734.12 [347.88]	-238.22 [182.15]
hectare decile=4	1,135.09 [597.12]	-331.22 [709.30]	-1,556.35 [348.84]	-169.9 [165.58]
hectare decile=5	656.62 [588.40]	-1,188.55 [698.94]	-1,721.02 [343.75]	-345.87 [168.38]
hectare decile=6	810.67 [586.80]	-1,083.07 [697.03]	-1,821.08 [342.81]	-209.65 [159.66]
hectare decile=7	875.33 [590.16]	-1,369.88 [701.03]	-2,079.89 [344.78]	-277.51 [170.48]
hectare decile=8	438.97 [599.90]	-1,816.14 [712.60]	-2,074.95 [350.47]	-232.3 [182.80]
hectare decile=9	249.13 [638.96]	-2,733.71 [759.00]	-2,783.99 [373.29]	-298.64 [178.01]
hectare decile=10	-315.67 [700.07]	-2,847.31 [831.59]	-2,278.36 [408.99]	-587.54 [190.82]
soil type=loam	-174.76 [400.06]	-249.94 [475.21]	-105.46 [233.72]	-7.57 [103.42]
soil type=clay	-511.77 [467.71]	-101.82 [555.58]	329.79 [273.24]	108.4 [117.99]
ph	-259.79 [249.19]	-118.68 [296.00]	200.78 [145.58]	-102.67 [59.12]
organic matter	-15.94 [151.08]	19.09 [179.46]	73.05 [88.26]	-46.63 [37.65]
topo: midslope	299.14 [1,595.93]	96.63 [1,895.74]	-295.81 [932.35]	499.03 [600.76]
topo: bottom (level)	663.23 [1,584.04]	358.48 [1,881.62]	-228.79 [925.41]	279.67 [593.65]
topo: steep slope	2.73 [1,625.75]	460.28 [1,931.16]	282.27 [949.77]	389.05 [609.07]
Constant	1,209.25 [2,186.75]	3,234.46 [2,597.55]	1,253.24 [1,277.51]	949.85 [702.08]
Observations	614	614	614	336
R-squared	0.81	0.52	0.9	0.89

all regressions include household-year fixed effects

standard errors in brackets

hectare decile=1, soil type=sand, topo=uppermost (level) excluded

Table 3: Robustness of base result

	1	2	3	4
	OLS	OLS	spatial GMM	spatial GMM*
	dep variable = profit x1000 cedis/hectare			
years of school	-61.9 [81.88]			
gender: 1=woman	-1,233.99 [570.43]	-858.66 [369.05]	-1043.43 [299.87]	-1666.78 [373.79]
ph	-153.47 [276.30]		-259.79 [88.51]	-346.83 [75.62]
om	-45.44 [159.16]		-15.94 [52.27]	154.97 [42.95]
Observations	558	888	614	575
Fixed Effects	household-year	household-year	household-year	household-year and spatial**

standard errors in brackets

plot controls and constant included in every regression

* spatial standard errors calculated as defined in footnote 5

** spatial fixed effects for unobserved characteristics in the plot neighborhood

Table 4: Profits and fallow duration

	1	2	3	4	5	6
	profit x1000 cedis/hect	OLS profit x1000 cedis/hect	IV profit x1000 cedis/hect	first stage fallow duration (years)	IV profit x1000 cedis/hect	first stage fallow duration (years)
fallow duration (years)	163.12 [47.88]	238.37 98.19	421.41 [225.67]		314.07 [182.00]	
fallow duration (years) squared		-4.30 4.90				
gender: 1=woman	-356.19 [397.00]	-370.24 397.43	19.28 [537.24]	-0.58 [0.67]	143.06 [426.13]	-0.43 [0.54]
1 if first of family in town				-0.44 [0.66]		0.29 [0.64]
years family/resp lived in village				-0.01 [0.01]		0.01 [0.01]
1 if resp holds trad. office				3.91 [1.11]		1.95 [0.80]
number of wives of father				0.39 [0.35]		0.52 [0.23]
number of father's children				-0.08 [0.07]		-0.02 [0.05]
parity of mom in father's wives				-0.44 [0.41]		-0.42 [0.36]
1 if fostered as child				0.86 [0.74]		0.35 [0.61]
size of inherited land				-0.29 [0.63]		-0.52 [0.57]
1 if mother had any education				-0.87 [1.17]		0.96 [1.05]
1 if father had any education				-0.13 [0.80]		-0.98 [0.63]
Observations	760	760	755	755	700	700
Fixed Effects	household-year	household-year	household-year	household-year	household year and spatial	household year and spatial
F-test of instruments				F(10,415)=2.10		F(10,381)=2.49

standard errors consistent with arbitrary spatial correlation in brackets
plot controls and constant included in every regression