

Empowerment and Efficiency: Tenancy Reform in West Bengal
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Objective :

- Evidence of productivity increase due to a tenancy reform in West Bengal, India during 1977-93.
Tenancy reform –
 - Offering security of tenure to tenants and
 - Regulating the share of output paid as rent.

Reform

- Operation Barga-

A major change in property rights
If the tenant is registered with the department of Land Revenue, he/she would be entitled to permanent and inheritable tenure on the land sharecropped as long as he/she pays the landlord at least 25 % of output as rent.

Area of application: State of west bengal in India during 1977-93

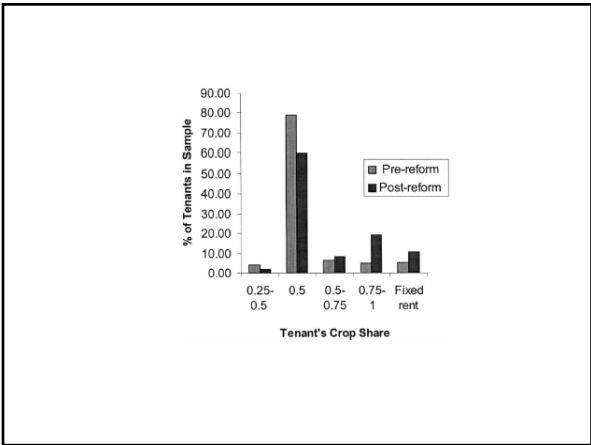
How different was the rule from the pre-existing one?

- Early land reform act of 1955
 - 1) Sharecropper will have permanent and inheritable incumbency rights to land that is registered to their name provided that they pay the legally stipulated share to the landlords, do not leave the land fallow, and do not sublease. Except in such cases, the tenant may lose rights if the landlord wants to use the land for personal cultivation.
 - 2) The share that the landlord can demand will be no greater than 25%

The early reform act failed for several reasons.

- 1) Landlords abused the personal cultivation exemption clause.
- 2) Tenants were responsible for registering themselves – coordination problem on part of the tenants – high bargaining power to the landlord (discuss!)
- 3) Government tends to favor landlords in legal disputes

Operation Barga was successful as it tried to address all the three issues (discuss!)



What does the reform do?

Theoretically, it has two partial effects.

- 1) Threat of eviction is reduced -> loss of efficiency
 Recall the 'action-unobservability' model we discussed in BU. A typical incentive scheme to induce effort looks like the following: Give high reward if output is high, and charge a penalty if it is low. A threat of eviction can work as a penalty even in presence of liability constraint, implying eviction threat increases effort. As the threat is reduced because of reform, there should be a loss in efficiency on this account.
- 2) Greater security of tenure -> high investment incentive & high bargaining power due to an improved outside option (discuss!)

The net effect can be positive or negative

Empirical evidence

Quasi experimental approach using district level data from Bangladesh as control group

Methodological issues:

Choice of control group : Bangladesh (earlier, East Pakistan) was separated from India in 1947, and operation Barga started almost thirty years later in West Bengal

Could we consider this land reform as an exogenous shock or an endogenous event which was bound to happen?

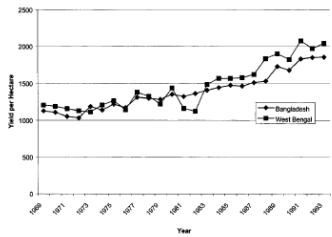


FIG. 4—Rice yield in West Bengal and Bangladesh, 1969-05

Empirical model

$$\ln y_{it} = \alpha_0 + \delta_i + \beta \times \text{treatment}_i \times \text{post}_t + \sum q_j X_{jit} + \epsilon_{it}$$

Simple difference in difference approach

Next, the model is adjusted with respect to time-varying controls, such as area under HYV cultivation, total rainfall, public irrigation.

TABLE 1
SUMMARY STATISTICS

	Log(Rice Yield, kg per Hectare)		HYV Rice ^a (%)	Proportion of Rice Area under Public Irrigation ^b (%)		Log(Rice Yield, kg per Hectare)		Log(Rainfall, mm)
	1969-83 (1)	1973-85 (2)		1973-85 (3)	1973-82 (4)	1973-85 (5)	1973-85 (6)	
West Bengal (Annual Observations on 14 Districts)								
Grand mean	7.24	7.52	.11	.49	10.01	6.99	7.42	
Standard deviation:								
Overall	.31	.31	.09	.23	1.80	.36	.41	
Within	.23	.22	.05	.15	.30	.27	.24	
Mean in:								
1969	7.00	—	—	—	—	—	—	
1977	7.20	7.20	.06	—	0.91	6.50	7.24	
1978	7.87	7.87	.08	.15	5.02	8.04	7.17	
1993	7.60	7.60	.15	.05	10.13	7.02	7.58	
Bangladesh (Annual Observations on 15 Districts)								
Grand mean	7.22	7.30	.15	0	11.36	—	7.69	
Standard deviation:								
Overall	.25	.29	.11	0	.30	—	.35	
Within	.19	.15	.07	0	.43	—	.21	
Mean in:								
1969	7.05	—	—	—	—	—	—	
1977	7.16	7.16	.09	0	11.00	—	7.62	
1978	7.14	7.14	.09	0	11.00	—	7.64	
1993	7.51	7.51	.20 ^c	0	11.79	—	7.84	

^a Fraction of total rice area devoted to the cultivation of the summer crop, kharif.
^b Proportion that are irrigated only for West Bengal and are available for the period 1978-85.
^c Public irrigated area (includes private irrigation also) with respect to total rice area irrigated.
^d This information is not available in a continuous series for Bangladesh during the period of analysis.
^e Information on HYV share for Bangladesh is available up to 1991, so this number pertains to 1991.

TABLE 2
DIFFERENCE-IN-DIFFERENCE MODELS OF LOG OF RICE YIELD PER HECTARE (1969-93)

	DIFFERENCE (1969-78)		LEVEL	
	(1)	(2)	1969-93	Excluding 1981-82
West Bengal (n=1)	.004	—	—	—
West Bengal ^a (1973-85) ^b	—	-.09***	-.01	(.28)
West Bengal ^a (1984-88)	—	.05**	.05**	(.20)
West Bengal ^a (1988-93)	—	.05*	.05*	(.178)
District fixed effects F	—	—	—	—
statistic	—	44.55	42.61	—
Year fixed effects F	—	—	—	—
statistic	4.26***	29.75***	31.81***	—
R ²	.12	.30	.31	—
Sample size	256	717	659	—

NOTE: -t-statistics are in parentheses.
^a These variables are obtained by interacting a dummy variable that takes the value one if a district is in West Bengal and zero if it is in Bangladesh with another dummy variable that takes the value one if the observation is in the indicated time period (1973-85 in this case) and zero otherwise.
^b Significant at the 10 percent level.
^c Significant at the 5 percent level.
^d Significant at the 1 percent level.

TABLE 3
DIFFERENCE-IN-DIFFERENCE MODELS OF LOG OF RICE YIELD (1977-91)

	West Bengal			Bangladesh (Excluding Years 1981-82)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
West Bengal ^a (1973-85)	-.09***	-.09***	-.09***	-.01	-.01	-.01
West Bengal ^a (1984-88)	-.01	-.01	-.01	-.01	-.01	-.01
West Bengal ^a (1988-91)	-.01	-.01	-.01	-.01	-.01	-.01
Log(Rainfall)	-.01	-.01	-.01	-.01	-.01	-.01
HYV Rice of grain substitution	-.01	-.01	-.01	-.01	-.01	-.01
District fixed effects F	—	—	—	—	—	—
statistic	83.02***	20.13***	14.20***	41.82***	13.87***	11.67***
Year fixed effects F	—	—	—	—	—	—
statistic	28.10***	12.14***	7.79***	21.02***	12.63***	6.63***
R ²	.42	.27	.25	.35	.25	.25
Sample size	624	624	602	362	362	362

NOTE: -t-statistics are in parentheses.
^a Significant at the 1 percent level.
^b Significant at the 5 percent level.
^c Significant at the 1 percent level.