

Labor Market Effects of Inconsistent Policy Interventions: Evidence from India's Employment Guarantees

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Introduction

- ▶ Wage increase in the private sector due to NREGA has been shown
 - ▶ empirically (Azam, 2012; Zimmermann, 2012; Berg et al., 2013; Imbert and Papp, 2015; Bahal, 2016).
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- ▶ What are the potential costs of an inconsistent program implementation?
- ▶ Especially in the presence of markets distortions like wage rigidities and employer market power.

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 - ▶ Forward looking employers compress wage increases today.
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- ▶ Empirically validates two key predictions:
 - ▶ Greater variability \implies larger compression of wage increases.
 - ▶ Compression of wage increases is more severe in districts with lower average inflation.

Theory

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- ▶ Relative to the static case, wage increase in the two-period framework is lower if the program provision deteriorates in future i.e. compression of wage increases.

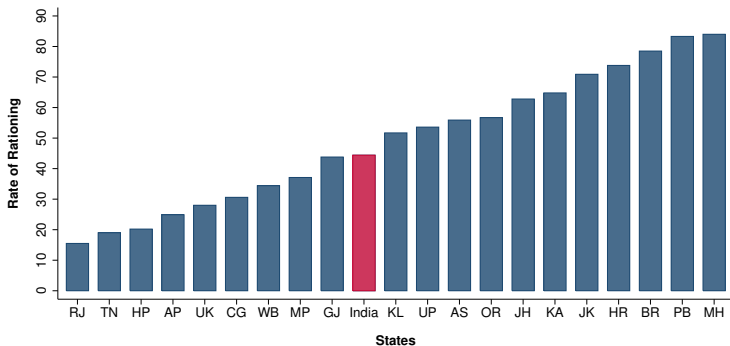
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- ▶ Relative to the static case, wage increase in the two-period framework is lower if the program provision deteriorates in future i.e. compression of wage increases.
- ▶ In the presence of uncertainty regarding future levels of programme provision, increase in uncertainty leads to further compression of the wage increase.

Descriptive Evidence

Government rations the demand for work under the EGS

Rationing rates in NREGA across Indian states

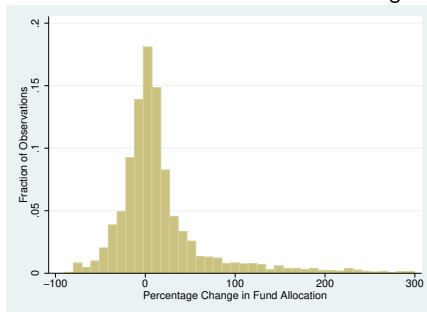


Source: Dutta et al. (2012).

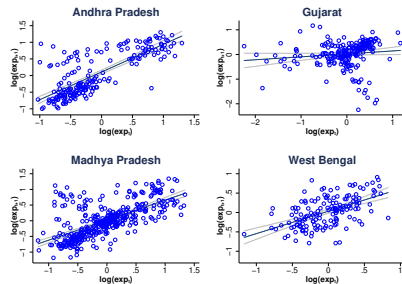
Descriptive Evidence

Inconsistent and variable EGS

Distribution of Fund Allocation Changes



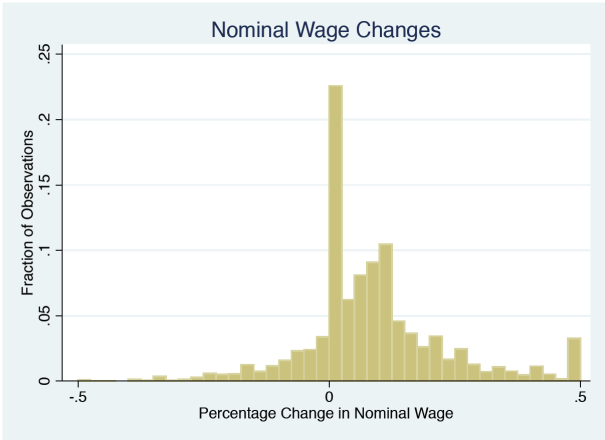
Predicted Versus Actual Expenditure



Note: Data is for 442 districts from 2001-2010 (4420 observations) as used in Bahal (2016). The unit of observation is a district-year.

Descriptive Evidence

Downward Nominal Wage Rigidity



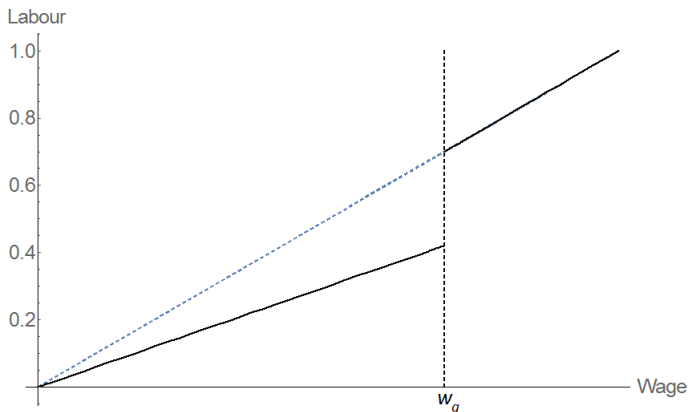
Source: Kaur (2014). The figure shows the histogram of year-on-year % changes in nominal agricultural wages for 256 districts from 1956-1987 taken from World Bank Climate and Agriculture dataset.

One Period Model of EGS

Key Assumptions

- ▶ Population of heterogenous workers of measure 1.
- ▶ Cost of working $c \sim U(0, C)$.
- ▶ Wage from private employment is w .
- ▶ Employer has market power.
- ▶ Production function is increasing and concave.
- ▶ EGS wage $w_g > w$.
- ▶ Employment under the EGS is rationed $r = 1 - \frac{e}{e_0} \in (0, 1]$.

Private Labor Supply with and without EGS



Note: The upward sloping dashed line represents the labor supply without EGS. The solid line is the labor supply for private employment when there is an EGS with the EGS wage being w_g and rationing rate r .

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- ▶ Private wage and employment with EGS is:
- ▶ $w_s^*(\underline{r}) > w_0^*$ and $l_s^*(\underline{r}) < l_0^*$.

Two Period Model of EGS

▶ Assumptions

- ▶ Program provision can fall in the next period i.e. $r_{t+1} > r_t$
- ▶ Wages are downwardly rigid, i.e. $w_{t+1} \geq w_t$.
- ▶ The employer maximizes $\pi_1 + \pi_2$

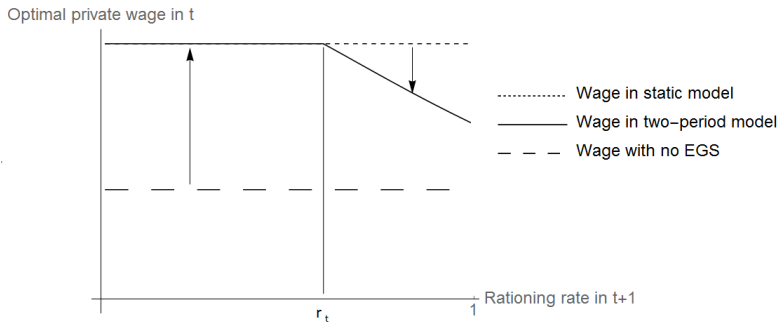
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- ▶ Employers faces trade-off between current and future profit.
- ▶ Hence if program provision deteriorates in the future:
- ▶ $w_t^*(\underline{r}_t, \underline{r}_{t+1}) < w_s^*(\underline{r}_t)$

Compression of Wage Increases



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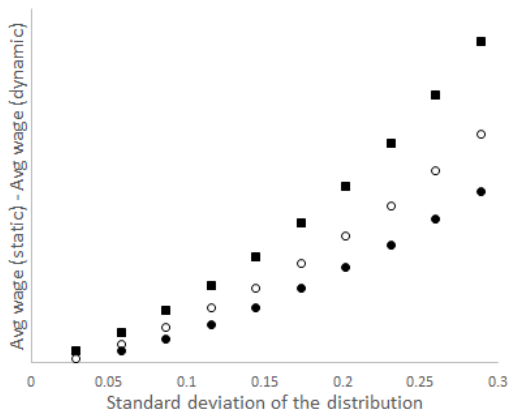
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- ▶ Either of two conditions is sufficient for the result
 1. $r_t \geq m$
 2. The production function should be unbounded and satisfy
$$\frac{d}{dx} \left(-\frac{xf''(x)}{f'(x)} \right) \geq 0$$

Compression of Wage Increases under Uncertainty



Note: The horizontal axis shows the standard deviation of the uniform distribution with mean $m = 0.5$. The vertical axis is the difference between the statically optimal and dynamically optimal wages averaged over the entire distribution of r_t under an EGS.

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- ▶ Compression of wage increases more severe under low inflation.
- ▶ Annual wage data from Agricultural Wages of India data.
- ▶ A novel dataset of employment expenditure under SGRY and NREGA (Bahal 2016).
- ▶ District-level annual data for 134 districts and 12 states from 2001-2010.

Testing the Theory

$$w_{i,t} = \beta_1 e_{i,t} + \beta_2 (e_{i,t} \times \sigma_i) + I_{NREGA} + \alpha_i + \gamma_t + \xi_i t + \beta X_{i,t}$$

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District: i ; Year: t ; $w_{i,t}$: wage

$e_{i,t}$: EGS expenditure; $\sigma_i = S.D.(e_{i,2001}, \dots, e_{i,2010})$

$\sigma_{i,t} = S.D.(e_{i,2001}, \dots, e_{i,t})$ for $t = 2002, \dots, 2010$

I_{NREGA} : Indicator for NREGA regime

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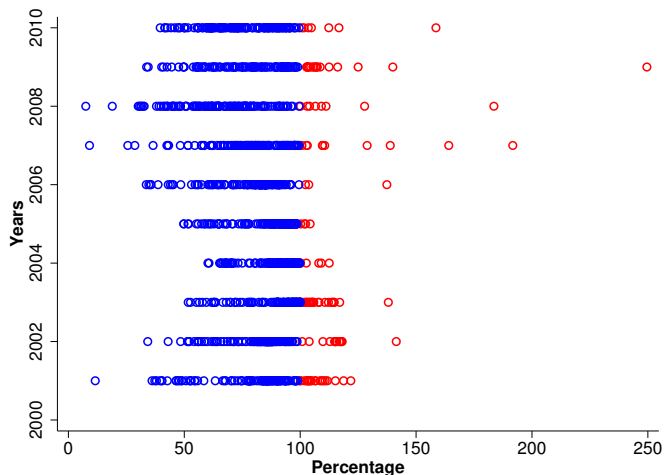
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- ▶ We use the availability of funds to instrument for the potentially endogenous actual expenditure
- ▶ The fund allocation process does not constrain the actual expenditure, it can exceed or fall short of the funds made available
- ▶ A negative or positive opening balance is adjusted in the next year's releases
- ▶ Any district-year specific shock, for example a negative weather shock, will be reflected in higher actual expenditure but would not be correlated with the predetermined fund availability.

Actual Expenditure as a Percent of Fund Availability



Note: The figure shows the year-wise utilization of funds as a percent of funds made available. The observations marked in red show over-utilization while the observations in blue represent under-utilization.

Table: Effect of Variability in Expenditure on Wages

	(1)	(2)	(3)	(4)
	OLS	2SLS	OLS	2SLS
$e_{i,t}$	0.553 [0.688]	1.811** [0.860]	1.273* [0.683]	1.843*** [0.680]
$e_{i,t} \times \sigma_i$	-0.001 [0.002]	-0.005** [0.003]		
$e_{i,t} \times \sigma_{i,t}$			-0.004 [0.003]	-0.006*** [0.002]
Observations	1340	1340	1206	1206
Ftest > 20		Yes		Yes

All estimates in the table are of the order of magnitude -2. The unit of observation is a district-year. Data is for 134 districts from 2001-2010. The dependent variable in all the regressions is real agricultural wage. All regressions include district and year fixed effects, heterogeneous trends and other district controls. Standard errors clustered at district level are reported in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table: Compression under High and Low Inflation

	(1)	(2)	(3)	(4)
	OLS	2SLS	OLS	2SLS
$e_{i,t}$	1.554 [1.017]	3.291** [1.285]	1.830** [0.763]	2.576*** [0.688]
<i>Low Inflation</i> $\overbrace{e_{i,t} \times \sigma_i}$	-0.017* [0.009]	-0.029** [0.012]		
<i>High Inflation</i> $\overbrace{e_{i,t} \times \sigma_i}$	-0.004 [0.003]	-0.010*** [0.004]		
<i>Low Inflation</i> $\overbrace{e_{i,t} \times \sigma_{i,t}}$			-0.015** [0.006]	-0.017*** [0.006]
<i>High Inflation</i> $\overbrace{e_{i,t} \times \sigma_{i,t}}$			-0.005* [0.003]	-0.006* [0.003]
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Ftest > 20		Yes		Yes

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- ▶ Reverses the welfare gain due to an EGS.
- ▶ More consistent program implementation can be welfare enhancing.