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Labor Market Reform and Poverty
– The Role of Informal Sector

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Abstract

Recent papers, discussing the impact of economic reform in India, argue that the positive effect of reform is more significant in states, which are not ‘labor friendly’. Also labor market reforms seem to be a pre-condition for success of liberal policies as far as their impact on poverty is concerned. We argue that the exact mechanism behind such a link is yet to be clarified. We try to provide such a mechanism in terms of a general equilibrium model involving formal and informal workers. Our framework is capable of providing such a link and shows that there are occasions when such link is violated.

Key words: Informal labor, capital mobility, labor market reform

JEL Classification: F13, F16, J21, J31, O17

1. Introduction

Economic reform and poverty in India has emerged as a topic of great interest among economists ever since India started liberalizing its economic policies in the early 1990s. High rates of GDP growth in the recent years have encouraged economists and policy analysts to explore whether such growth has contributed to the reduction in poverty across states. Although rates of poverty in urban and rural areas have shown declining trends in general, the outcome varies considerably across states. Topalova (2005), for example, argues that tariff reduction on importable commodities has not been effective in reducing the incidence and depth of poverty across districts in India with concentration of import-competing activities. Using a specific factor model of trade the study shows that in the presence of limited factor mobility, trade liberalization caused to increase the extent of rural poverty in India. In a similar vein (also considering product and labor market deregulations) and in connection with the effect of trade on poverty in India, Hasan, Mitra and Ural (2006) provide contradictory evidence showing that the impact of trade reform on poverty is actually more visible in states with relatively 'flexible' labor market conditions. Moreover, this is consistent with the position of Besley and Burgess (2004). Flexible labor market characteristics, as exemplified and quantified by Besley and Burgess (2004) do however, have some exceptions. According to their results, Maharashtra and Gujarat despite being labor friendly in terms of the conditions set out in this paper have shown impressive improvements.

The present study intends to trace the exact link between labor market flexibility and poverty in the presence of a huge informal labor market, as would be the case with most developing countries, including India. Labor market rigidities usually lead to the

hiring of informal workers who are hired at a wage rate lower than the one prevailing in the formal sector. More specifically, in India more than 90% of the workforce is absorbed in the informal segment if agriculture is included in the estimate. On the other hand, in the presence of less aggressive labor unions pro-employer governments may help to reduce hiring and firing costs of the organized workers. Hence, in those states more people are likely to find jobs in the formal sector. Greater employment should consequently have a negative impact on poverty. Here we confine ourselves only to the definition of income poverty, such that people are poor if they earn a low wage as is common among the informal sector workers in many poor countries. The workers do not have to be necessarily unemployed in order to be considered poor; they may have a job and may still be living in stark poverty due to the prevalence of very low market determined wages. It is also likely that a more employer friendly policy will lead to a rise in the informal wage since increased labor demand in the formal sector will subsequently draw from the pool of informal workers. Thus, if informal workers are poor to start with, flexible labor market conditions should increase their wages and hence reduce poverty. Therefore, there are two distinct effects of labor market reforms on poverty, as reflected in rising wage in the informal segment and more employment in the formal sector.

This is however, a fairly naive and incomplete argument. The realities certainly demand consideration of more intricate relationships. Suppose, we consider capital to be freely mobile between the formal and the informal sectors. Then, as flexible labor market conditions increase return to capital in the formal sector, capital is drawn into the formal sector and away from the informal sector. A pure supply side response will then be a cut back in the existing wage in the informal sector, hurting the left-out informal workers.

Moreover, if formal sector does not expand sufficiently despite increased inflow of capital, poverty must go up. Therefore, depending on the degree of capital reallocation between the formal and the informal sector two countervailing possibilities can be distinctly captured through a competitive general equilibrium framework.

In situations where capital faces a more restrictive mobility condition, stringent labor market regulations are harmful for informal workers since low employment in the formal segment leads to greater crowding into the informal sector lowering the wage rate.

However, if capital could move freely, aggressive trade unions in the organized sector will cause to push capital away into the informal segment thereby raising the informal wage despite substantial absorption of workers. Hence, the interest of the organized and unorganized workers will converge. Thus whether labor market reforms help the informal workers depend on the behaviour of capital flows.

The problems with some of the recent papers written on the impact of reform in India and its relationship with labor market flexibility are quite a few. First, the exact theoretical or testable hypothesis regarding the relationship between labor market reform and poverty is not properly analyzed. Second, in the presence of a vast informal labor market, the focus should have been much more on this segment rather than on the organized sector. Third, it is evident from the various rounds of NSSO that real informal wage has increased substantially in all the states in the post-reform era with absolutely no revolutionary changes in labor market conditions anywhere. This fact has been hardly taken into account.

However, in a recent paper Marjit and Kar (2007) show that the effect of trade reform on the real informal wage in various states in India is positive and such

improvement in the informal wage can be significantly explained by the accumulation of real fixed assets and gross value added in the so-called urban Non-Directory Manufacturing Enterprises (NDMEs, employing up to five workers, as per NSSO definitions). Furthermore, they show by constructing a panel for the states and over the years (1984-85 to 2000-01 with five year intervals in the data series) that the incidence of urban poverty (BPL percentage) in a given period is negatively and significantly affected by a rise in the informal wage in the previous period.

With this backdrop the present paper draws on the growing literature on informal labor market in the developing economies and builds up a model where product market reform and labor market are simultaneously implemented in a general equilibrium framework allowing for some degree of capital mobility. In this set up product market reform and labor market reform have conflicting outcomes depending upon the degree of inter-sectoral capital mobility.

The second section describes the working of the basic model drawn from Carruth and Oswald (1981), Agenor and Montiel (1996), Marjit (2003), Marjit and Maiti (2006) and Marjit, Kar and Beladi (2007). It also discusses the impact of both types of reform and derives conditions under which both will improve the informal wage. The informal wage in this paper is used as a proxy for poor people's income and may be interpreted as the minimum requirement for being on the margin. Any drop in wages would push the individuals below the poverty line. Section 3 concludes.

2. The Model

We have a two sector economy producing X and Y with labor and capital. X is

produced in the formal sector with workers paid a fixed wage \bar{w} . If workers do not find a job in the formal sector, they go the informal sector where everyone gets a job and earns a market determined wage w . It is assumed that $\bar{w} > w$. Note that, \bar{w} though exogenous in the framework, can be endogenously determined either through the action of an optimizing union (Carruth and Oswald, 1981), Dasgupta and Marjit (2006)¹ or through a model of ‘effort observability’ as developed by Esfahani and Saleh-Isfahani (1989). Agenor and Montiel (1996) make extensive use of this framework in analysing development policies in a macroeconomic context. The fixity of \bar{w} is assumed because the crucial focus of the analysis rests elsewhere as we shall describe and one can treat changes in \bar{w} as changes in effective hiring cost. Thus lowering of \bar{w} is synonymous with more flexible labor market conditions.

X and Y both are traded goods with prices exogenously determined in the rest-of-the-world. This is the case of a small open economy. We shall discuss the implications of relaxing this assumption later. However, the fixity of prices is an artefact to focus on the pure supply side responses. One can provide a more profound justification behind such assumption.

In a very interesting paper, Foster and Rosenzweig (2004) argue that whenever there has been a productivity increase in the Indian agriculture, the consequent higher rural wage has discouraged rural industrialization. Thus the supply side effect could not be compensated by greater demand for local goods through the increased income effect. Therefore, the importance of supply side effect must not be ignored even if there might be some demand side repercussions.

¹ See appendix for a brief derivation on endogenous wage formation in the presence of labor unions in the formal sector.

In our model, the production functions exhibit CRS and diminishing returns and the markets are competitive. Capital is imperfectly mobile between the formal and the informal sectors. Absolute immobility of capital at one end gives us the specific-factor model while the perfect mobility yields a 2x2 Heckscher-Ohlin-Samuelson framework. These are two special cases in our model.

Competitive price conditions imply

$$\bar{w} a_{LX} + r a_{KX} = P_X (1 + t) \quad (1)$$

$$w a_{LY} + R a_{KY} = P_Y \quad (2)$$

a_{ij} s are input-output coefficients derived by factor price ratios ‘ t ’ denotes a measure of “protection”/artificial subsidy/protective regulation which protects market and effectively increases the price. Workers try to find a job in the high wage sector. The unsuccessful ones are absorbed in the informal sector.

$$a_{LX} X + a_{LY} Y = \bar{L} \quad (3)$$

Full employment of capital implies

$$K_X + K_Y = \bar{K} \quad (4)$$

$$a_{KX} X = K_X \quad (5)$$

$$a_{KY} Y = K_Y \quad (6)$$

However, K_X and K_Y once allocated act as imperfect substitutes. In other words, there is a mobility cost.

$$\frac{K_X}{K_Y} = f\left(\frac{r}{R}\right), f' > 0 \quad (7)$$

One can show that, $\hat{K}_X - \hat{K}_Y = \mu(\hat{r} - \hat{R}) \quad (7a)$

Where ‘ Δ ’ denotes proportional change and $\mu \in [0, \infty)$ denotes the mobility elasticity with $\mu = 0$, it is a standard specific factor model. With $\mu \rightarrow \infty$, we have perfect mobility of capital.

(3), (4), (5) and (6) can be combined as,

$$\frac{a_{LX}}{a_{KX}}(\bar{K} - K_Y) + \frac{a_{LY}}{a_{KY}}.K_Y = \bar{L} \quad (8)$$

Given $P_X(1 + t)$ and \bar{w} , (1) determines r . Hence, $\frac{a_{LX}}{a_{LY}}$ gets determined. Then (2),

(7) and (8) determine w , R , K_Y .

In this framework, product market reform implies a decline in t and labor market reform is synonymous with a decline in \bar{w} .

From equations (1) and (2) it is perfectly possible to pre-empt the isolated implications of product market reform and labor market reform in the economy. We would nevertheless derive a general condition in the appendix in order to emphasize on the potential impact of a simultaneous occurrence of both, which also leads to proposition I we present below. Intuitively, a product market reform only, i.e. a decline in t , with full mobility of capital should indicate a decline in the sectoral rates of return to capital and hence an improvement in the wage received by the workers in the informal sector. On the other hand, a labor market reform, where the workers in the formal sector now suffer due to a fall in the negotiated wage, would cause to draw in capital from the other sector given the initial differential in the rates and subsequently lower the return to the informal workers as well. The argument may be summarized as the following claim.

Claim I:

- a. *Perfect mobility of capital implies that the labor market reform hurts the informal workers while the product market reform is beneficial for them.*
- b. *Immobility of capital implies exactly the opposite of (a)*

When both the product market reform and the labor market reform are undertaken simultaneously the implications are countervailing and therefore an improvement in the informal wage is only conditionally feasible. And yet, there is a possible case that both can lead to beneficial impact on the informal wage (see appendix for proof).

Proposition I: $\exists \mu, \mu \in \left(\frac{A_1}{B_1 C}, \frac{A_1}{B_2 C} \right)$ *such that both types of reform undertaken simultaneously will improve w .*

Proof: A fall in both t and \bar{w} increase the informal wage under ‘some’ capital mobility if and only if, the income-share of labor used in the production of commodity X is positive and less than 1. Since this is always true except for the special case where X is produced by labor only, which is not relevant here, there always exists a possibility of wage gain for the informal workers (detailed proof in appendix).

Proposition I implies that although the success of both types of reform depends on the extent of capital movement and in a way conflicting in nature, there are certain degrees of capital mobility as defined in the above range, when the positive impact of tariff reduction outweighs the negative impact of labor market reform. This is not a trivial result since this is tantamount to identifying the critical degree, or at least the critical zone of capital mobility that can ensure a rise in informal wage despite presence of labor market reforms. This zone may certainly be treated as important information

when considering capital mobility as a policy variable for improving the conditions of the poor informal workers is a target.

Aggressive labor

Aggressive labor force may negotiate a higher formal wage compared to a more submissive labor force. Another way of characterizing labor aggressiveness should be as follows. No matter whether it is the formal or the informal sector, a region is said to be more aggressive if perceived labor cost is higher than in another region with the same (\bar{w}, w) . This is justified by the observation that it might be more expensive to maintain the same level of productivity in two regions. Relatively aggressive workforce might imply bad work culture, loss of actual time of work etc. Even though for the organized workforce it may not get reflected in the nationally negotiated wage rate, it will be reflected in the local informal wage rate. We capture this effect by a factor $\alpha > 1$ attached to the labor coefficient in the competitive price conditions. What we show next is that the Besley and Burgess (2004) proposition is an outcome of our general equilibrium framework.

Once we use the wider interpretation of the phenomenon of labor aggression, the competitive price conditions change to

$$\bar{w}\alpha a_{LX} + ra_{KX} = P_X(1+t) \quad (9)$$

$$w\alpha a_{LY} + ra_{KY} = P_Y \quad (10)$$

With $\alpha > 1$ implying more aggressive labor force.

Differentiating we get,

$$\hat{w}\theta_{LY} = -\theta_{KY}\hat{r} - \theta_{LY}\hat{\alpha}$$

$$\begin{aligned}
&= -\theta_{KY} \left(\frac{\hat{T} - \theta_{LX} \hat{\alpha}}{\theta_{KX}} \right) - \theta_{LY} \hat{\alpha} \\
&= -\frac{\theta_{KY}}{\theta_{KX}} \hat{T} + \hat{\alpha} \left[\frac{\theta_{KY} \theta_{LX}}{\theta_{KX}} - \theta_{LY} \right]
\end{aligned} \tag{11}$$

Note that even if we do not bring in the policy reform into the picture, greater value of α will reduce informal wage if X is relatively capital intensive, a reasonable assumption we suppose. More aggressive labor will affect the informal workers because the effect of a unit cost increase will be felt more on a sector which uses greater amount of labor per unit. For the same reason the positive effect of trade reform on w , a drop in T , will be dampened.

3. Concluding Remarks

Product market and labor market reforms should have different impact on informal wage, a benchmark of poor people's income in a developing country. The role of capital mobility becomes quite crucial in the context. While more flexible capital movement between the formal and informal segments helps in improving the informal wage in the context of product market reform, the same may hurt informal workers when hiring (or firing) costs go down in the formal sector. This implies that labor-friendly states will have high informal wage when capital does not move much. This in turn implies that a labor friendly state will do better when capital does move a lot. Movement of capital can itself be a time dependent phenomenon. We propose to examine the theoretical outcomes with the help of the data available through the NSS. Our earlier empirical analysis strongly suggests that the capital formation in informal sector pushes

up the informal wage and the rise of wage has significant negative impact on urban poverty between 1989 and 2000.

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Appendix

Endogenous determination of \bar{w}

The labor union is concerned only with the wage setting in the formal sector, i.e. sector X , given the sectoral stock of capital (we will derive two variations – one with the sector-specific capital and the other with fully mobile capital).

The Union's utility function is given by:

$$U = U(\bar{w}, L_X(\bar{w})) \quad (\text{A.1})$$

$$\text{where, } L_X = a_{LX} X = \frac{a_{LX}}{a_{KX}} \bar{K}_X = \phi\left(\frac{\bar{w}}{r}\right) \bar{K}_X$$

$$= \phi\left(\frac{\bar{w}}{f(P_X, \bar{w})}\right) \bar{K}_X \quad (\text{A.2})$$

since from competitive price conditions in equation (1), r is determined by (P_X, \bar{w}) .

Now, given \bar{K}_X , it is easy to show from (A.2) that $\frac{\partial L_X}{\partial \bar{w}} < 0$, as $\phi' < 0$.

$$\text{From (A.1), } \frac{\partial U}{\partial \bar{w}} = 0 \Rightarrow \frac{\partial U}{\partial \bar{w}} + \frac{\partial U}{\partial L_X} \frac{\partial L_X}{\partial \bar{w}} = 0 \quad (\text{A.3})$$

Let us assume sufficient restrictions on U , such that, $\frac{\partial^2 U}{\partial \bar{w}^2} < 0$. From (A.3), consider an

equilibrium value of formal wage solving the relation: \bar{w}^*

We have now set the framework for capturing the labor market reforms. Consider a slight modification of equations (A.1) and (A.2), as follows,

$$U = U(\bar{w} \gamma, L_X(\bar{w} \gamma)) \quad (\text{A.1.1})$$

$$\text{and } L_X = \phi\left(\frac{\bar{w} \gamma}{f(P_X, \gamma \bar{w})}\right) \bar{K}_X \quad (\text{A.2.1})$$

where, $\gamma > 1 \Rightarrow \text{Pro-labor regulations}$
 $\gamma < 1 \Rightarrow \text{Anti-Labor regulations}$

It also implies that any rise in γ would be a move towards pro-labor regulations and vice versa. Given (γ, \bar{K}_X, P_X) and with some restrictions on the functions,

$U(\cdot)$, $\phi(\cdot)$ and $f(\cdot)$ we can derive,

$$\bar{w}^* = \varphi(\gamma, \bar{K}_X, P_X) \quad (\text{A.3})$$

We reinstate this optimal value of \bar{w}^* in equation (A.3) and differentiate totally with respect to γ , such that the relationship between union-determined wage rate and the

labor market reform turns out to be negative, i.e., $\frac{d\bar{w}^*}{d\gamma} < 0$.

Thus, any percentage change in the formal wage as determined by union bargaining can be explicitly written as a linear combination of the percentage change in the arguments:

$$\hat{\bar{w}}^* = -\alpha_1 \hat{\gamma} + \alpha_2 \hat{P}_X + \alpha_3 \hat{\bar{K}}_X, \quad \alpha_i > 0, i = 1, 2, 3 \quad (\text{A.4})$$

Now using equations (1) and (2), we can re-write the equations of change (with fixed commodity prices) as:

$$\hat{\bar{w}} \theta_{LX} + \hat{r} \theta_{KX} = -\hat{\gamma} \theta_{LX} \quad (\text{A.5})$$

$$\text{and} \quad \hat{w} \theta_{LY} + \hat{R} \theta_{KY} = 0 \quad (\text{A.6})$$

Using (A.5) and (A.6), $(-\alpha_1 + 1) \hat{\gamma} \theta_{LX} + \hat{r} \theta_{KX} = 0$

Here, as long as, $(-\alpha_1 + 1) > 0$, a rise in $\hat{\gamma}$ will lead to a fall in \hat{r} , and the rest of the results hold. In other words, a move towards pro-poor labor regulations would unambiguously reduce the return to capital accruing to that sector. The result would be indifferent even if capital were fully mobile between the two sectors earning the same return in both places. The added implication would have been a rise in the unorganized

wage as well due to a pro-labor market reform. In fact, we have argued in the main text that places where the reform is labor friendly in nature, the informal sector can register an increase in wages with palpable impact on the level of poverty, provided capital is relatively free to move.

General Condition for Claim I:

We are interested in the impact of a decline in t and \bar{w} on w , the informal wage. We have to solve for \hat{w} as a function of $\hat{\bar{w}}$ and $(1+\hat{t})=\hat{T}$. We follow Jones (1971) and Marjit and Kar (2007) closely to derive the following, by differentiating equations (8) and using (7a).

$$-\lambda_{LX} \frac{\sigma_X}{\sigma_{KX}} (\hat{\bar{w}} - \hat{T}) - \mu \lambda_{KX} (\lambda_{LY} - \lambda_{LX} \frac{\lambda_{KY}}{\lambda_{KX}}) (\hat{r} - \hat{R}) \quad (A.7)$$

Where λ s are allocation shares of labor and capital in each sector, σ s are elasticity of factor substitution and θ s are the cost-shares. Substituting for \hat{r} , \hat{R} etc. by differentiating competitive price equations we get,

$$\hat{w} = \hat{T} \frac{[-A_1 + \mu B_1 C]}{-D_1 - \mu D_2 C} + \hat{\bar{w}} \frac{[A_1 - \mu B_2 C]}{-D_1 - \mu D_2 C} \quad (A.8)$$

Where,

$$A_1 = \frac{\lambda_{LX} \sigma_X}{\theta_{KX}}, B_1 = \frac{\lambda_{KX}}{\theta_{KX}}, B_2 = \frac{\lambda_{KX} \theta_{LX}}{\theta_{KX}}, C = \lambda_{LY} \frac{\lambda_{LY} \lambda_{KY}}{\lambda_{KY}}$$

$$D_1 = \frac{\lambda_{LY} \sigma_Y}{\theta_{KY}}, D_2 = \lambda_{KY} \frac{\theta_{LY}}{\theta_{KY}}$$

(A.8) helps us in framing Claim I.

Proof of Claim I (a): When $\mu \rightarrow \alpha$, from (A.8)

$$\hat{w} = \hat{T} \cdot \frac{B_1}{-D_2} + \frac{\hat{w}}{\hat{w}} \cdot \frac{B_2}{D_2}$$

Therefore, $\hat{w} > 0$ if $\hat{T} < 0$ and $\hat{w} < 0$ if $\frac{\hat{w}}{\hat{w}} < 0$

Proof of (b): When $\mu \rightarrow 0$, from (A.8)

$$\hat{w} = \hat{T} \cdot \frac{A}{D_1} + \frac{\hat{w}}{\hat{w}} \cdot \frac{A_1}{-D_1}$$

Therefore, $\hat{w} < 0$ if $\hat{T} < 0$ and $\hat{w} > 0$ if $\frac{\hat{w}}{\hat{w}} < 0$. QED

Proof of Proposition I:

From (A.8)

$$\hat{w} = \frac{\hat{T}(A_1 - \mu B_1 C)}{D_1 + \mu D_2 C} + \frac{\hat{w}}{\hat{w}} \frac{(\mu B_2 C - A_1)}{D_1 + \mu D_2 C} \quad (\text{A.9})$$

It is easy to check that

$$\frac{\hat{w}}{\hat{T}} < 0 \text{ iff } A_1 < \mu B_1 C \text{ and } \frac{\hat{w}}{\hat{w}} < 0 \text{ iff } \mu B_2 C < A_1$$

Therefore, for both types of reform to have a positive impact on w one must have,

$$\frac{A_1}{B_2 C} > \frac{A_1}{B_1 C} \text{ Or, } \frac{1}{B_2} > \frac{1}{B_1}$$

Or, $B_2 < B_1$ which always holds as $0 < \theta_{LX} < 1$.