Implementing labor standard in a developing economy*

Vivekananda Mukherjee¶
Jadavpur University, Calcutta, India.

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¶ Address for correspondence: Department of Economics, Jadavpur University, Calcutta: 700032, India.
E-mail: mukherjeevivek@hotmail.com

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Abstract

This paper develops a model of a developing economy with formal and informal sectors of production. It shows that at the basic equilibrium without exogenously fixed labor standard the formal sector offers better labor standard to its workers than the informal sector. Then it analyzes the distributional impact of an exogenously fixed labor standard on the wages, labor standard (where the exogenous standard is not binding) and therefore the overall welfare of the workers, the profit of the firms in either of the sectors. It finds out that if the standard is binding in the informal sector alone, the firms in the informal as well as the formal sector loses. The welfare of the informal sector labors remains the same while the formal sector labors gain. However, if the labor standard is binding for both the sectors, the firms in both the sectors as well as informal sector labors lose. But, interestingly the formal sector labors gain only if the standard is below a certain level. The paper also considers the case where the labor standard is binding only in the formal sector of production. It shows that the profits of both the formal and informal sector firms as well as the informal sector remains unchanged. The welfare of the formal sector labors falls. The formal sector labors get better labor standard but lower wage. It also considers the effect on the wage gap between the sectors.

Keywords: Informal sector, Formal Sector, Labor Standard.
JEL Classification: J3, J8

Introduction

The purpose of this paper is to study the distributional impact of imposition of an exogenously fixed labor standard in a typical developing economy with both the formal and informal sectors of production in terms of the wages offered to the workers, the profit of the firms in either of the sectors and the labor standard offered to the sector of production where the exogenous standard is not binding. The paper derives its motivation from the recent debate related to the demand from the developed countries at the WTO to relate international trade with the labor standard prevailing at the trading countries. There are two fold allegations against the developing countries that on the one hand they are practicing "regulatory chill" and promoting the "race to the bottom" with respect to their domestic low labor standards to restrict the market access of the developed country products (produced with higher standards and therefore more costly) and on the other hand they are gaining more and more market share at the developed country markets by supplying cheaper products produced by lower standards[1]. However, this is not the only reason for which there is a proposal to link the labor standard at the developing countries with trade. There are other reasons too. There is no denying of the fact that some genuine altruistic concerns always have been there among the activist groups in the different countries in the world about the plight of the workers at the informal sectors of developing economies who are set to work under miserable conditions. So far the International Labor Organization (ILO) was the institution to provide the international forum to express these concerns but it did not have any effective mechanism to enforce

[1] See Anderson (1998) for a discussion.

the internationally accepted norms about the labor standards anywhere in the world[2]. Now, if the export of a commodity gets linked with the labor standards maintained to produce that commodity, these norms may have their bite on the different trading countries in the world. In this way the 'social clause' associated with the WTO negotiations may evolve as a major instrument to enforce these norms around the world. However, the trade economists are not comfortable with this proposal as they think adding 'social clause' to WTO agenda may restrict the free trade between the countries depriving them to reap the benefit of the free trade. Although there exists a perspective that the existing instruments under the purview of the WTO like negotiated tariffs can be efficiently used to achieve these objectives without explicitly imposing the restrictions related to labor standards, the possible administrative complexity associated with such a mechanism leads even the advocates of such mechanisms to think that imposition of higher standard on the developing countries may be an easy way out [Bagwell and Staiger (2001)]. Therefore, it seems reasonable to be skeptical about the possibility that the production sectors in the developing countries in future are going to face an exogenously fixed labor standard negotiated at the international level. This paper tries to construct a framework to predict the likely distributional impact of that on the sectors of production of the developing economies.

There is a growing literature on studying the impact of international standard on the economies. The paper by Singh (2001) provides an excellent survey of the issues involved in it. Chau and Kanbur (2001) discuss the timing of adopting the international standard for a country. There are papers like Basu (1999), which indirectly touches upon these issues in the context of banning the child labor in the developing countries on international pressure. It seems the single most important distinguishing factor between the production structures in the developing countries as opposed to the developed countries in the world is that they have a large informal sector of production employing most of the labors in the economy who are unskilled[3]. It is generally observed that the labor standard offered in these two sectors are not the same. The formal sector firms offer

[2] See Brown (2001) and Sing (2001) for discussion.
[3] In a developing country like India 93% of its total labor force is employed in the informal sector.

much better labor standard to its workers compared to the firms in the informal sector. There is hardly any paper in the literature, which explains the existence of two different standards in the two sectors of production. But to analyze the impact of imposing of an exogenously fixed standard in a developing economy we need a framework to show how the labor standard gets determined in either of these sectors without any constraint and only then we can perform some comparative static exercise with respect to the newly imposed standard. This paper proceeds exactly in this sequence. First it builds up a framework where at the equilibrium two different standards exist in the informal sector and the formal sector production and shows that the standard at the informal sector of production is lower than the standard in the formal sector production. The model uses a structure like the specific factor model of trade with skilled labor is specific to the formal sector and the unskilled labor is specific to the informal sector of production, but it uses the bargaining framework of the theory of compensating differential [Rosen (1986)] in its analysis for the determination of wages and standard unlike the traditional way of doing it in the specific factor model[4]. It turns out that the factor intensity of production in the two sectors, mobility of capital between the sectors and the fact that the informal sector workers enjoy virtually no bargaining power against the employers unlike their fellow workers in the formal sector play crucial roles in explaining the differential labor standards in these sectors. Then it considers the impact of imposition of labor standard at every possible level on this economy. It finds out that if the exogenously fixed labor standard is binding in the informal sector alone, the firms in the informal as well as the formal sector will be losing. The welfare of the informal sector labors will remain the same while the formal sector labors will be gaining. The formal sector labors get higher wage rate as well as better labor standard. The wage gap between the sectors will be increasing. However, if the labor standard is binding for both the sectors, just like in the previous situation both the formal and the informal firms will be losing. The informal sector labors will not be able to maintain their statusquo in this situation and will be losing. But, interestingly the formal sector labors will not be gaining unambiguously as in the earlier situation: if the standard is above a certain level they will also be losing. The paper also considers the case where the labor standard is binding only in the formal sector

[4] For an application of specific factor model on an issue of trade reform see Marjit, Kar and Sarkar (2003).

of production. There it shows that the profit of both the formal and informal sector firms remain unchanged. The welfare of the informal sector labors remains unchanged while the welfare of the formal sector labors falls. The formal sector labors get better labor standard but lower wage. The wage gap between the formal and informal sector labors decreases. Therefore, it also makes an important observation that in such a situation instead of as is expected in the economic literature that the firms will move from the formal to informal sector of production (for which hardly any empirical evidence has been found), it may well happen that the impact gets manifested through the falling wage gap between the sectors.

The plan of the paper is as follows: in the next section it describes the model and explains the results. In the section following it concludes.

The Model

Consider a developing economy divided into a formal and an informal sector of production. The formal sector uses more capital-intensive technique of production compared to the informal sector. Labors employed in the formal sector are more skilled and limited in supply. The informal sector employs the unskilled labors abundant in the developing countries. The labors are specific to the sectors of production *i.e.* they cannot move from one sector to the other sector. But, the capital can freely move between the sectors. The utility function of the labors is denoted by $U(x, l, s)$ where x represents the amount spent on consumption, l represents leisure and s represents the index of 'labor standard'.[5] The function is increasing in its argument and assumed to be strictly quasi-concave. The labors solve the following optimization exercise by choosing $x(w, T, s)$ and $l(w, T, s)$:

Max $U(x, l, s)$ such that $x = w(T - l)$ where T represents the maximum available working hours and w represents the wage rate.

At the optimum we define the indirect utility function $v(w, s)$ (suppressing T for convenience). The function $v(w, s)$ is increasing and strictly quasi-concave in its argument. We also assume it to be homothetic. However, given the level of indirect utility there is a trade off between the index

[5] The higher value of s represents better labor standard.

of labor standard and the wage rate. If the labor prefers to have better labor standard he can achieve it by accepting a lower wage rate at a constant level of indirect utility. We assume the labors in the formal sector have similar kind of preference pattern and therefore have the same indirect utility function $v(w, s)$ over (w, s) with a difference. The only difference between the labors in the two sectors of production is that the labors in the formal sector are more skilled. Acquiring skill has a cost. So, the reservation utility level of the labors in the formal sector v_f is higher than the reservation utility level of the labors in the formal sector v_i. The relation between the reservation utility levels of the formal and informal sector labors is represented by the following equation:

$$v_f > v_i . \tag{1}$$

On the production side a representative firm in the informal sector maximizes its profit $[f(l, k, s) - wl - rk - c(s)]$ by choosing $l(w, r)$, $k(w, r)$ and $s(w, r)$ where k, r and $c(s)$ represent the amount of capital, the cost of per unit of capital and the cost of implementing the labor standard. We assume $c'(s)>0$ and $c''(s)>0$. Clearly, at the optimum in choosing the level of labor standard along with the number of labors and the amount of capital to be employed, the firm equates the marginal benefit from implementing the labor standard with the marginal cost of it *i.e.* it satisfies the following condition: $f_s = c'(s)$. Observe, while deciding about the optimum level of labor standard the firm takes into account only the beneficial impact of implementing the standard on its own productivity and ignores the positive externality it has on the welfare of the labors employed in the firm. Since, the positive external effect on the workers' welfare is ignored, typically the firm sets a lower standard than desired by the workers. The workers however do not object to the lowly fixed labor standard as long as the firm adequately compensates them by a higher wage rate at their desired utility level.[6] This is the way the wage rate and the labor standard get jointly determined in a firm. The firm and the labors bargain over the pair of wage rate and the labor standard to be implemented. Observe the decision about the number of labor and the amount of capital to be employed by the firm now gets dissociated with the decision about the optimum labor standard. Therefore, a representative firm ends up maximizing its profit $[f(l, k, s) - wl - rk - c(s)]$ by choosing $l(w, r, s)$ and $k(w, r, s)$. We define the profit function of the firm by $\pi_i(w, s)$ which is decreasing in its argument and is assumed to be strictly quasi-convex. Given the profit level there exists a trade off between the wage rate and the labor standard: an increase in the wage rate reduces the profit level but adopting a lower labor standard can compensate the loss. Now, we look at the game determining the wage rate and the labor standard pair. In the developing

[6] This is in accordance with the theory of compensating differential discussed in details by Rosen (1986).

countries the unskilled labors employed in the informal sector virtually have no bargaining power *vis-à-vis* the firm and they accept any offer given by the firm on the wage rate and labor standard pair as long as they get their reservation level of utility. So, the reservation utility level of the workers becomes the binding constraint while the firm maximizes its profit by choosing *(w, s)*. The firm solves the following optimization exercise:

Maximize $\pi_i(w, s)$ subject to (w, s) such that $v(w, s) = v_i$.

The Lagrangian expression for the problem is as follows:

$L = \pi_i(w, s) + \lambda[\, v_i - v(w, s)]$

where $\lambda \neq 0$ represents the Lagrange multiplier. To find the solution we maximize L subject to (w, s). The strict quasi-convexity of $\pi_i(w, s)$ and the strict quasi-concavity of $v(w, s)$ gives a unique solution to the above maximization problem. We assume existence of an interior solution to the problem. Suppose, (w_i , s_i) solves the problem and represents the equilibrium wage rate and the labor standard in the informal sector. Then at the optimum the following conditions are satisfied:

$$\frac{\dfrac{\partial \pi_i}{\partial s}}{\dfrac{\partial \pi_i}{\partial w}} = \frac{\dfrac{\partial v}{\partial s}}{\dfrac{\partial v}{\partial w}} \tag{2}$$

$$v(w_i , s_i) = v_i \tag{3}$$

The left hand side of equation (2) represents the slope of the iso-profit curves of the firm and the right hand side represents the slope of the indifference curves corresponding to the indirect utility function of the labors. The iso-profit curve of the firm becomes tangent to the indifference curve representing the reservation utility level v_i of the labors. The equilibrium is shown in the figure below:

Figure 1

Since $\pi_i(w, s)$ is decreasing in its argument choosing a (w, s) combination further to the southwest direction in the *w-s* plane as in the figure above helps the firm to achieve a higher level of profit. But, in its profit maximization exercise it is constrained by the participation constraint of the labors. Therefore, it chooses that point on the labors' indifference curve, which is the most profitable from its own point of view. Clearly, the point of maximum profit is the point of tangency between the two curves *i.e.* the point E_i in the figure above. We denote the profit earned by the firm at the equilibrium by $\overline{\pi}_i$.

A representative firm in the formal sector of the economy has a profit function $\pi_f(w, s)$. Similar to the profit function of the firms in the informal sector $\pi_f(w, s)$ is also decreasing in its argument

and strictly quasi-convex. The only difference is that the firms in the formal sector of production use more capital-intensive technology. Therefore the trade off between the labor standard and the wage rate at a given level of profit is more favorable for a firm operating in the formal sector. At any level of profit implementing a higher labor standard is more costly to the firm in the informal sector and it has to reduce the wage cost at a steeper rate to keep the profit level intact. This assumption is represented by the following equation:

$$\frac{\frac{\partial \pi_i}{\partial s}}{\frac{\partial \pi_i}{\partial w}} > \frac{\frac{\partial \pi_f}{\partial s}}{\frac{\partial \pi_f}{\partial w}} \tag{4}$$

The formal sector firms unlike the firms in the informal sector of the economy find themselves in the bilateral monopoly situation against the skilled labor force, which is limited in supply. Therefore, the equilibrium *(w, s)* depends on the bargaining strengths of the firms and the labor force in the formal sector and one expects it to be indeterminate. However, it is not impossible to predict the equilibrium *(w, s)* in formal sector in relation to the inter-sectoral equilibrium for the entire economy. Observe, at the inter-sectoral equilibrium of the economy the formal sector firms and the informal sector firms should earn the same profit otherwise we would expect capital to flow from the lower profit earning sector to the higher profit earning sector. Let the equilibrium level of profit of the formal sector firms be $\overline{\pi_f}$. Since the firms in the informal sector earn $\overline{\pi_i}$ it must also be the case at the equilibrium the following equation is satisfied:

$$\overline{\pi_f} = \overline{\pi_i} . \tag{5}$$

In the formal sector, at the equilibrium the labors maximize their utility *v(w, s)* by choosing *(w, s)* subject to the constraints $\pi_f(w, s) = \overline{\pi_i}$ and $v(w, s) \geq v_f$. We assume the participation constraint of the labors $v(w, s) \geq v_f$ is automatically satisfied otherwise the equilibrium does not exist. So, the Lagrangian expression for the problem becomes:

$Z = v(w, s) + \mu[\overline{\pi_i} - \pi_f(w, s)]$

where $\mu \neq 0$ represents the Lagrange multiplier. Similar to the case of the informal sector firms, to find the solution we maximize *Z* subject to *(w, s)*. The strict quasi-convexity of $\pi_f(w, s)$ and the strict quasi-concavity of *v(w, s)* gives a unique solution to the above maximization problem. We assume existence of an interior solution to the problem. Suppose, (w_f, s_f) solves the problem and represents the equilibrium wage rate and the labor standard in the formal sector. At the optimum the following conditions are satisfied:

$$\frac{\frac{\partial v}{\partial s}}{\frac{\partial v}{\partial w}} = \frac{\frac{\partial \pi_f}{\partial s}}{\frac{\partial \pi_f}{\partial w}} \tag{6}$$

$$\pi_f(w, s) = \overline{\pi}_i \tag{7}$$

Since $v(w, s)$ is increasing in its argument, choosing a (w, s) combination further to the northeast direction in the w-s plane helps the labors to achieve higher level of utility. But, in their utility maximization exercise the labors are constrained by the minimum profit to be earned by the firm *i.e.* $\overline{\pi}_i$. If they want to raise their utility further by choosing a point on the contract curve the capital flows out of the formal sector and the formal sector firms cease to exist. Therefore, it chooses that point on the firms' iso-profit curve at the profit level $\overline{\pi}_i$, which provides them with the maximum possible level of utility. Clearly, the point of maximum utility is the point of tangency between the two curves. From the above discussion it follows that the inter-sectoral equilibrium of the economy looks like the following figure:

Figure 2

In the above figure CC represents the 'contract curve', the locus of possible bargaining solutions between the formal sector firms and the skilled labors. The point E_i represents the informal sector equilibrium as in figure 1 and the point E_f represents the formal sector equilibrium. Observe also, in the figure above E_f lies to the right of E_i. This is because it can be argued that at the equilibrium of the economy described in this model the positions of the points E_f and E_i have to be like this. Figure 2 has been drawn obeying all the restrictions the model imposes on the equilibrium of the economy. Since the formal sector is more capital intensive and therefore equation (4) is true, the iso-profit curves of the formal sector firms are flatter than the iso-profit curves of the informal sector firms. The iso-profit curves $\overline{\pi}_i$ and $\overline{\pi}_f$ touch each other on the vertical axis, therefore satisfies $\overline{\pi}_f = \overline{\pi}_i$ as in equation (5). Since $v > v_i$ we also satisfy equation (1) *i.e.* $v_f > v_i$ in the above figure. It follows from equation (2), (6) and (4) that the value of $(\frac{\partial v}{\partial s} / \frac{\partial v}{\partial w})$ in the informal sector equilibrium is higher than the value of $(\frac{\partial v}{\partial s} / \frac{\partial v}{\partial w})$ in the formal sector equilibrium. Since, the indirect utility function $v(w, s)$ is homothetic, negatively sloped and strictly quasi-concave the marginal rate of substitution $(\frac{\partial v}{\partial s} / \frac{\partial v}{\partial w})$ can attain a lower value only at

a higher value of *s* and a lower value of *w*. Therefore, our model predicts at the equilibrium it is for sure $s_f > s_i$. However, the prediction about the wage rate to be found in the formal and informal sector is not straightforward. It depends crucially on the extent of difference in capital intensity between the sectors. If the formal sector far more capital intensive than the informal sector it is expected that $w_f < w_i$. However if the difference in capital intensity is not much then there is a possibility of finding $w_f > w_i$. Figure 2 describes the situation in which the formal sector is not too capital intensive. We report this result in the first proposition of our model as:

Proposition 1: *The formal sector firms offer better labor standard to its workers than the firms in the informal sector. If the formal sector firms are sufficiently more capital intensive it offers lower wage to its workers. It offers higher wage otherwise.*

In the developing countries the formal sector and the informal sectors of production do not differ much in terms of capital intensity. Therefore, our model predicts that the formal sector firms must be offering both higher wage and better labor standard to the skilled workers employed in the sector compared to the unskilled labors employed in the informal sector. This is more or less an apt description of the reality observed in most of the developing countries. So, for the analysis of the impact of the exogenously fixed labor standard in the developing countries we can use the framework developed above and the basic equilibrium described in figure 2. Let us denote the exogenously fixed labor standard by $\bar{s}$. The exogenously fixed standard acts as a binding constraint on the behavior of the firms in the sense that if imposed they cannot survive without implementing it.[7] Clearly, labor standard will not be a binding constraint in the behavior of the firms in the economies already maintaining a labor standard better than the exogenously fixed standard i.e. having $\bar{s} < s_i < s_f$.[8] In a situation like this the equilibrium described in proposition 1 and figure 2 above remains valid without any change. So, we are left with two possible situations $s_i < \bar{s} < s_f$ and $\bar{s} > s_f$. In these cases depending on the value of $\bar{s}$, the exogenously fixed labor standard becomes a binding constraint on the behavior of the firms in at least one or both of the informal and formal sectors of the economy. We analyze the changes in the basic equilibrium in each of these cases.

Case 1: $s_i < \bar{s} < s_f$

[7] For example consider the situation when the demand for the product produced by the firm violating the labor standard becoming zero. This will possibly be he case with many of the developing country firms exporting their product to the developed countries once the labor standard gets ratified through WTO.

[8] In the developed countries the informal sector does not exist and the labors in the formal sector enjoys considerable bargaining power such that at the equilibrium it is found the higher labor standard is maintained.

In this case the exogenously fixed labor constraint becomes binding only on the behavior of the informal sector firms. The informal sector firm is now bound to offer the standard $\bar{s}$ to its labors. Since implementing higher standard is costly to the firm it digs into its profit. The firm reacts by offering a lower wage to the labors but while doing this it keeps into consideration the participation constraint of the labors in the informal sector $v(w, s) \geq v_i$. So, the firm chooses (w_i', $\bar{s}$) which satisfies $v(w, s) = v_i$ and maximizes its own profit. Suppose, the new profit level of the firm is denoted by $\overline{\pi_i}$' . Since $\overline{\pi_i}$ was the profit of the firm in the unconstrained equilibrium it must be $\overline{\pi_i}$'< $\overline{\pi_i}$ in the constrained equilibrium. The new equilibrium E_i' is represented in the following figure:

Figure 3

The firm's new profit level $\overline{\pi_i}$' is denoted by the iso-profit curve passing through the point E_i'. Since the iso-profit curve representing $\overline{\pi_i}$' is located to the north east of the iso-profit curve representing $\overline{\pi_i}$, clearly it is $\overline{\pi_i}$'< $\overline{\pi_i}$. The informal sector firm loses in the new equilibrium. However, this is not the equilibrium situation for the economy as a whole. From equation (5) it follows that now we are in a situation where $\overline{\pi_f}$ > $\overline{\pi_i}$' which induces flow of capital from the informal sector to the formal sector.[9] Therefore, at the new equilibrium for the economy it has to be $\overline{\pi_f}$' = $\overline{\pi_i}$' where $\overline{\pi_f}$' is the equilibrium profit of the formal sector firms. It follows from equation (5) and the fact that $\overline{\pi_i}$'< $\overline{\pi_i}$, at the new equilibrium it is also the case that $\overline{\pi_f}$' < $\overline{\pi_f}$. As a result of imposition of labor standard in the formal sector the equilibrium profit of the firms in the formal sector also decreases. The point E_f' describes the new formal sector equilibrium in figure 3. Observe, as the capital flows in the formal sector from the informal sector, the bargaining strength of the formal sector firms gets weakened *vis-à-vis* the formal sector labors. Therefore, in the bargaining over *(w, s)* the formal sector labors can secure a better position E_f'on the contract curve CC in figure 3. At the new equilibrium the formal sector labors gain both in terms of wage rate compared to the initial equilibrium as $w_f' > w_f$ and in terms of labor standard as $s_f' > s_f$. The indirect utility level of the formal sector labors *v'* is also higher than *v* in the new equilibrium. Therefore, the labors in the formal sector will be gaining. We note these results in the next proposition of the model:

[9] We assume, the flow of capital from one sector to another sector does not change the interest rate in the economy, which is identical in both the sectors.

Proposition 2: *If the exogenously fixed labor standard is binding in the informal sector alone, the firms in the informal as well as the formal sector will be losing. The welfare of the informal sector labors will remain the same while the formal sector labors will be gaining. The formal sector labors get higher wage rate as well as better labor standard.*

The above proposition shows that the imposition of labor standard in the informal sector of the economy defeats its purpose. If the objective of such a policy had been to improve the welfare of the workers in the informal sector, our results suggest that would not happen. The labor standard in the informal sector firms will definitely improve but the labors will lose in terms of their wage. At the same time the formal sector labors will be gaining both in terms of wage and labor standard. Here, we can draw an important corollary to the above proposition, which we note separately because of the recent interest in the literature on the wage-gap theories[10] consequent on trade and economic reforms, as follows:

Observation 1: *If the labor standard is imposed in the informal sector alone, the wage gap between the formal and the informal labors increase.*

Case 2: $\bar{s} > s_f$.

We consider the following two sub cases in this context: (a) the labor standard is the binding constraint for both the sectors and (b) the labor standard is the binding constraint only in the formal sector of the economy.

(a) The labor standard is the binding constraint for both the sectors.

The analysis is similar to the earlier case. As the exogenously fixed labor standard is set at a very high level and it is binding on the informal sector firms they reduce the wage rate further such that the participation constraint of the informal sector labors $v(w, s) \geq v_i$ gets satisfied just at equality. As a result the welfare of the informal sector labors does not change but the profit level of the informal sector firms reduces to $\overline{\pi_i}$' as at the point E_i' in figure 4 below denoting the equilibrium of the informal sector of the economy.

Figure 4

Since capital can move freely between the two sectors of the economy it must be at the equilibrium of the economy as a whole $\overline{\pi_f}$' = $\overline{\pi_i}$'. But, now since $\bar{s} > s_f$ provides a binding constraint to the behavior of the firms in the formal sector the 'contract curve' of bargaining between the formal sector labors and firms change to $\bar{s}$ CC. The best the labors in the formal sector can secure for themselves in bargaining with the firms is a point like E_f' in figure 4

[10] See Marjit and Acharyya (2003).

which describes the equilibrium in the formal sector. If the standard $\bar{s}$ is not set at a very high level, in particular if it is the case that $\bar{s} < s_x$ the formal sector labors gain in terms of welfare as $v' > v$ even though they may now get a lower wage rate. However, if the labor standard is set at a very high level such that $\bar{s} > s_x$ it turns out that the formal sector labors actually be losing in terms of welfare as it becomes $v' < v$. Similar to the former case the formal sector firms will be losing in this case also. The above discussion allows us to state the next proposition of the model as:

Proposition 3: *If the labor standard is binding for both the sectors, both the formal and the informal firms and the informal sector labors will be losing. If* $\bar{s} < s_x$ *the formal sector labors will be gaining and if* $\bar{s} > s_x$ *they will be losing.*

As in the earlier case it is difficult to predict the effect of implementing the labor standard on the wage gap between the sectors. This is because the wage rate will be falling in both the sectors at the same time.[11] So, if $\bar{s} > s_x$ the labor standard has an overall depressing effect on the economy and it fails to deliver better welfare to either of the formal and informal sector labor force. In all other cases only the formal sector labors gain at the cost of the firms and the welfare of the formal sector labors does not change.

(b) The labor standard is the binding constraint only in the formal sector of the economy.

In this situation the labor standard does not act as a binding constraint on the behavior of the informal sector firms. Therefore, the informal sector equilibrium E_i remains unchanged as in figure 1. The profit level of the informal sector firms remains the same at $\overline{\pi_i}$ as in the initial equilibrium. The level of indirect utility of the informal sector labors also remains the same at the initial equilibrium level of v_i. Following the logic behind finding the equilibrium of the economy it must be case that the formal sector firms are earning the same level of profit as the informal sector firms at the equilibrium i.e. $\overline{\pi_f} = \overline{\pi_i}$. But, at the profit level $\overline{\pi_f}$ as the formal sector firms abide by the standard $\bar{s}$ the maximum amount of wage it can offer to its workers is w_f" which is given by the point ($\bar{s}$,w_f") on the contract curve $\bar{s}$ CC in the following figure:

Figure 5

[11] However, if the wage rate has downward rigidity in the formal sector due to greater bargaining power of the labors and it becomes a binding constraint on the behavior of the firms the wage gap increases. But, in such a situation the formal sector firms need subsidy for their survival or the capital flows out the informal sector.

At ($\bar{s}$,w_f") the formal sector labors earn an indirect utility level *v"* which is lower than the indirect utility level v they enjoy at the initial equilibrium E_f. But, the labors accept this unfavorable condition because if they try maintaining the status quo the firms earn lower profit then $\overline{\pi_i}$ and the capital moves out from the formal sector to the informal sector. The threat of capital outflow from the formal sector compels the formal sector labors to concede the point E_f" as an equilibrium position. Therefore, at the new equilibrium of the economy everything remains the same except the fact that the welfare of the formal sector labors falls. They enjoy better labor standard but their wage rate falls.[12] We note these results in the next proposition of our model as:

Proposition 4: *If the labor standard is binding only in the formal sector, the profit of both the formal and informal sector firms remain unchanged. The welfare of the informal sector labors remains unchanged while the welfare of the formal sector labors falls. The formal sector labors get better labor standard but lower wage.*

As the formal wage rate falls while the informal wage rate remains unchanged the formal-informal wage gap narrows down.[13] This is a corollary to proposition 4 but an important observation that directly follows from the framework we are using in this paper. We note it separately as:

Observation 2: *If the labor standard is binding in the formal sector alone, the wage gap between the formal and the informal labors decreases.*

The above observation is interesting because it provides an explanation to the recent empirical findings from the developing countries that the imposition of standard has not been reflected in the movement of capital from the formal sector to the informal sector. This paper anticipates this effect and suggests that to find out the impact we should instead look at the wage gap between the formal and the informal sector labor force. If the labor standard is implemented only in the formal sector the wage gap must be non-increasing.

Conclusions

This paper tries to analyze the effect of implementing an exogenously fixed labor standard in a developing economy comprising a formal and an informal sector of production. It builds up a framework in which without the exogenously fixed labor standard at the equilibrium the

[12] They can maintain the same wage rate at the new labor standard and improve their level of indirect utility if and only lf the government subsidizes the formal sector firms.

[13] However, the wage gap remains constant if the government subsidizes the formal sector firms.

formal sector firms offer a higher standard to its labors than the firms in the informal sector. It compares the basic equilibrium with the equilibria in which the labor standard is imposed exogenously and it is binding in at least one of the sectors. We find that if the standard is binding only in the informal sector, the firms in the informal as well as the formal sector will be losing. The welfare of the informal sector labors will remain the same while the formal sector labors will be gaining. The informal sector labors get lower wage rate while the formal sector labors get higher wage rate and therefore the wage gap between the sectors increases. The formal sector labors also get better labor standard. If the standard is binding on both the sectors, as in the earlier situation both the formal and the informal firms and the informal sector labors will be losing. However, if it is set at a level too high the formal sector labors will also be losing. We have also discussed the situation, which is the most prevalent in the developing economies where the labor standard is binding only in the formal sector. This model predicts that in such a situation the profit of both the formal and informal sector firms remain unchanged. The welfare of the informal sector labors remains the same. However, the bargaining power of the formal sector labors erodes in the face of the threat of capital flight out of the sector and the welfare of the formal sector labors falls. The formal sector labors get better labor standard but lower wage. But as the wage of the informal labors remains the same the formal-informal wage gap falls. So the paper suggests that in the empirical works when we try to see the effect of imposition of labor standard in a developing economy, rather than looking at whether there has been any capital outflow from the formal to informal sector we should look at whether there has been a consequent change in the wage difference between the sectors. If it is non-increasing, then the imposition of the standard has an effect on the economy.

The paper suggests that the effect of implementing the labor standard in a developing economy is more or less depressing. In some of the cases the formal sector labors gain but in all other cases the welfare of all other segments of the economy either remains unchanged or deteriorates. This pessimistic result partly depends on the fact that this model looks at the problem solely from the supply side. Imposition of labor standard could have a favorable demand effect if the demand for the products produced by the standard-implementing firms could go up in the world market. However, one must realize that the increase in demand for exported products is difficult to come by in the real world. Therefore, this paper describes the real life apprehensions reasonably well. It provides a framework for the developing countries to understand the likely distributional impact on their economies before being involved in the WTO negotiations over labor standards. From the technical considerations also this paper is

different from the other papers in the literature because it deals with a specific factor general equilibrium model without the assumption of constant return to scale technology and the zero profit conditions. It develops an alternative bargaining framework to discuss the similar types of issues discussed in the context of the specific factor model without its restrictive assumptions.

All the results of the paper depend on some assumptions. First, we assume the two sectors differ in their capital intensity of production. The formal sector production has been assumed as capital intensive and the informal sector production has been assumed as labor intensive which is reasonable in the context of developing economies with some exceptions. Second, it assumes the firms in the two sectors operate in two different types of labor market and the labor markets are completely segregated from each other. In the model the formal sector uses the skilled labor limited in supply and the informal sector uses the unskilled labor unlimited in supply. The assumption of complete segregation of the labor markets is justified in the short run. Third, it assumes the interest rate is the same across the sectors with perfect capital mobility between them. However, the paper also discusses the justification of existence of a lower interest rate in the formal sector in the cases where the wage rate has downward rigidity. Fourth, it develops on a presumption that both the sectors are traded sectors. Fifth, the paper assumes that the labors in the formal and the informal sector have the similar preference pattern except that they have different reservation utility levels. This is a simplifying assumption. However, a case can be made that the preference pattern of the formal sector labors is more biased towards the standard. The model can extended relaxing some of these assumptions. Specifically, the relaxation of the assumptions about the perfect mobility of capital between the sectors in violation of the third assumption mentioned above or the mobility of the skilled labor from the formal to informal sector of production in violation of the second assumption may give rise to interesting possibilities. These remain as future research agenda.

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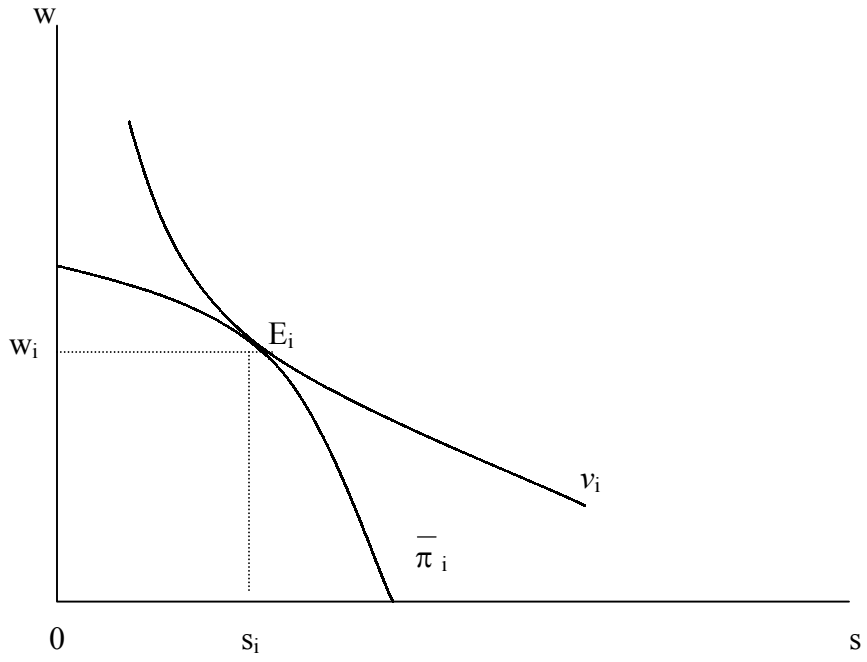

Figure 1

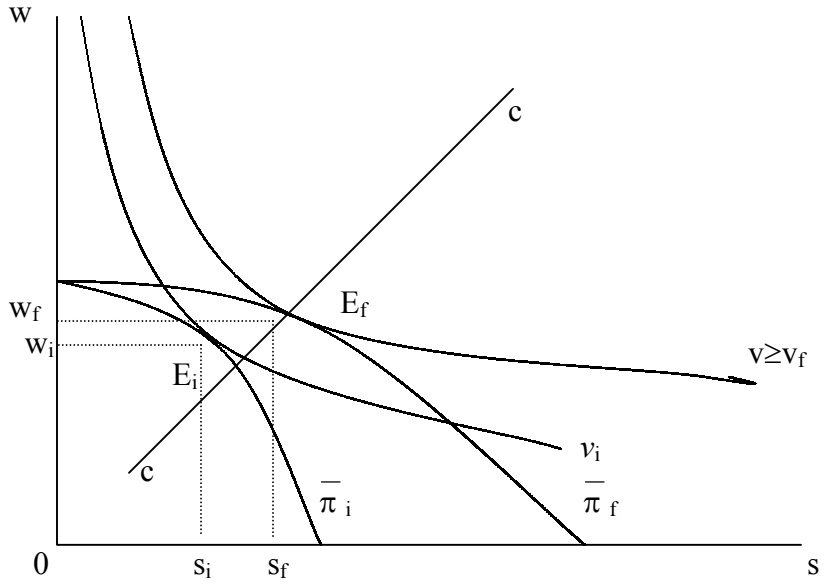

Figure 2

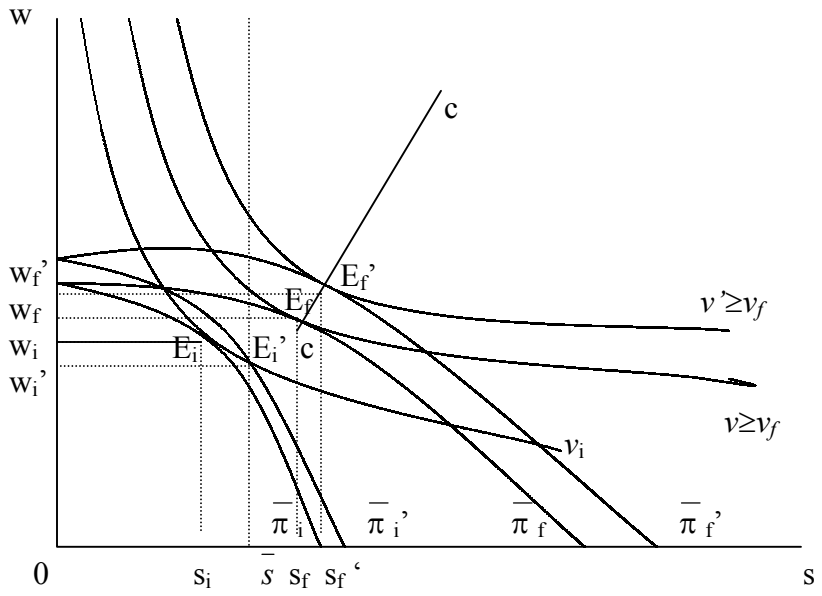

Figure 3

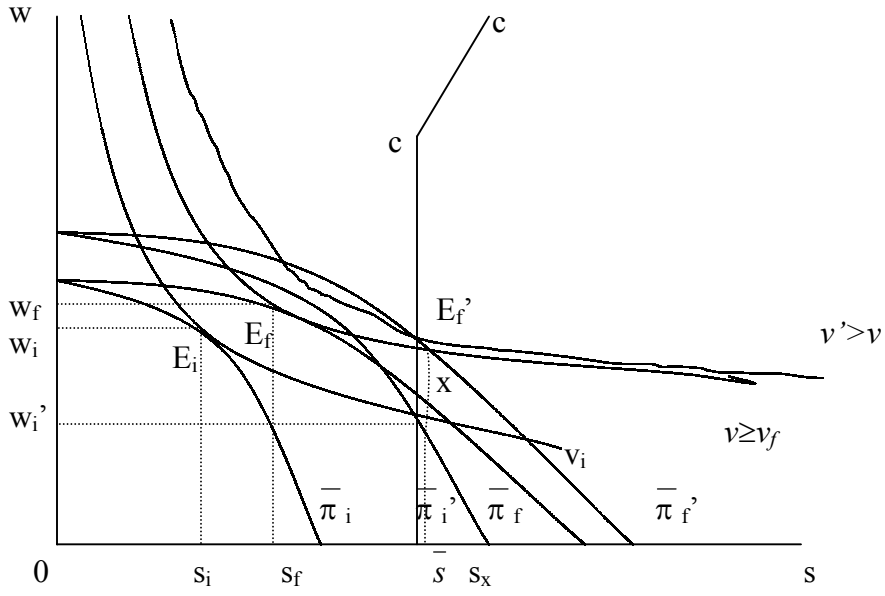

Figure 4

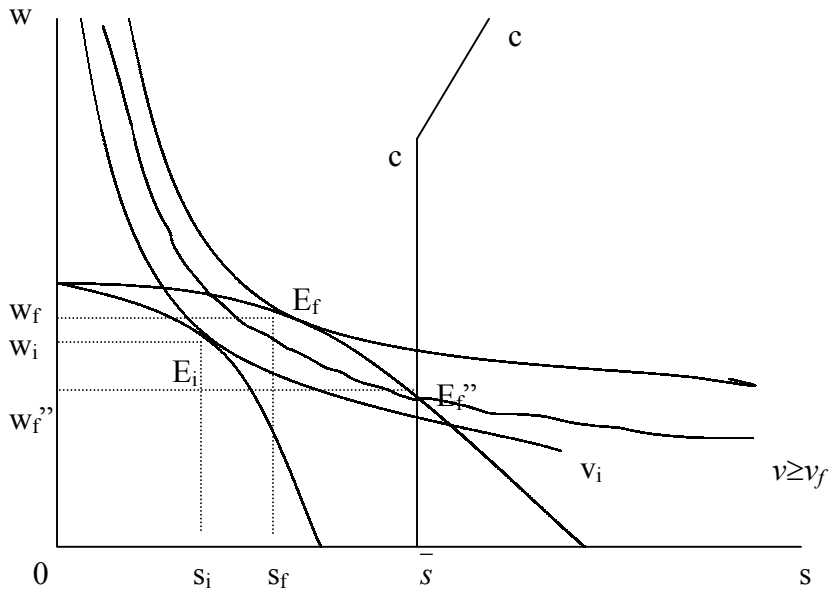

Figure 5