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Trade versus Non-Trade Policy in a Two Sector General Equilibrium Framework

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Abstract

This paper seeks to investigate the impact of trade as well as non-trade policy on child labour supply in a 2-sector general equilibrium framework. The paper explores, though trade policy is ineffective in eradicating child labour incidence but non-trade policy functions effectively in this aspect.

Keywords: Child labor; General equilibrium

Introduction

The formation of World Trade Organization (WTO) with effect from January 1, 1995, following the Uruguay Round (UR) Agreement at Maracas, with a view to ensure fair and free trade practices among member countries, has brought to focus the issues relating to labour standards and environment The developed countries tried to force these issues in the Seattle meeting held in Seattle, Washington, from November 29 to December 3, 1999. As far as the issue of labour is concerned, there are two points that have been highlighted by the developed countries. The first relates to core labour standards and the second to child labour. Regarding the use of child labour, the demand of the developed nations has been that trade in commodities using child labour in many developing nations is unfair, and be banned– the children should go to school rather than to work. This position sounds fair on ethical and normative grounds, but it ignores the hard realities of the poor developing countries, where child labour use is conditioned by economic compulsions of the poor parents. Children in these countries are sent to work because their families are too poor to send them to school. Barring children from work will not mean that they will start going to school from the next day. If anything the loss of income will mean a further setback for their already poor families. The experience of Bangladesh in this context is well known. When about seven-eight years ago European Union boycotted the export of garments manufactured in Bangladesh on the ground that child labour was being used in manufacturing them, thousands of children lost jobs and landed up in other worse paid jobs. The fact of the matter is that child labour is prevalent in developed countries such as the USA, UK, Italy, Portugal and Spain as well. However, developing countries are not in a position to take trade measures against them to eliminate the incidence of child labour employment [1-3].

While the developing countries are fighting for some development space in the uneven battles in the World Trade Organization (WTO), they are losing development options in the regional trading arrangements (RATs) and bilateral free trade arrangements (FTAs) that involve obligations which have been successfully averted in the WTO. The emergence of these mini-WTOs is like opening a door to new and significant obligations. Countries like India that are not yet caught in the major developed countries' bilateral web have some important lessons to learn for future from this new wave. Preventing child labour use either by legislation, or by use of restrictive trade policies may not be successful in eliminating the incidence of child labour use in such labour abundant poor countries, they end up losing their international market access or worsening trade balances and lowering the level of national welfare, while other non-trade policies may be somewhat effective in reducing this incidence [4-6].

International pressure through the boycott of the product produced by child labour may have a limited impact. Again children pushed out of one industry can often readily move to another. However, to the extent that individual manufacturers are persuaded that their products will not be sold abroad unless they can demonstrate that they do not employ child labour, international market pressures can have an impact. A ban by importers of goods produced by children, even if there were an effective way of labeling goods, would have only a marginal impact on the total employment of the children; other sectors of the economy are expanding rapidly enough to meet the supply of child labour. Wherever economic expansion occurs there will be a niche for children. Still international pressures should not be dismissed. The moral as well as the legal sanctions implied by a ban may deter some employers from hiring children, but those who choose not to obey will find it easy to evade enforcement. As a practical matter, the staff required minimally to enforce a ban on child labour would be enormous, given the number of workshops, restaurants, landowners and households employing children. So long as the number of children in the labour force are as high as they are, a legal ban on employment, though helpful is likely to have only a limited impact on child labour [7,8].

There is a vast theoretical and empirical literature covering

i)   Different causes

ii)   Magnitudes and

iii)   Policy prescription for child labour problems

In this paper, our objective is to investigate the efficacy of trade and non-trade policy in the context of child labour incidence. We want to make a comparison between the two policies following their impacts on Child labour supply [9,10].

The Model

The assumptions of the model are as follows:

i)   We consider a small open economy.

ii)   The economy consists of two sectors and three factors of production. Sector 1 produces an exportable commodity (X) with the help of adult labour and child labour. In this paper we assume that rest of the world (ROW) imposes trade restrictions in such a way that exporters of the small open economy has to pay tax t on per unit export of X, resulting in reduction of the effective producer's price of X. Sector 2 is import competing sector of the economy. It produces importable commodity (Y) with the help of adult labour and capital. Thus adult labour in our model is perfectly mobile between the sectors but child labour and capital are specific factors of production. Child labour is specific in our model in contrast to the model by Chaudhuri and Gupta (2004), and it is specific in use in the export sector and capital is specific in import competing sector of the economy.

iii)   We assume that adult labour is perfect substitute for child labour. It is assumed that an adult labour is equivalent to b number of child worker where b>1. Each adult worker earns a wage W^A. The child wage rate W^C must be (W^A/b) when adult wage rate is W^A.

iv) Production functions exhibit constant returns to scale with diminishing marginal productivity to each factor.

v)   We assume that all inputs are fully employed and all markets are perfectly competitive. Stock of capital and adult labour force are exogenously given.

vi)   The prices of the traded goods X and Y are given internationally, due to our assumption of a small open economy.

vii)   Each firm maximizes profit.

viii)   In our model demand for child labour originates from the general equilibrium structure of the small open economy and supply from the household comparison of parental utilities from sending the child to work or to school.

The following symbols will be used in the formal presentation of the model:

$a_{L_a i}$	: Adult labour- output ratio in the i sector, i =X,Y
$a_{L_C X}$	: Child labour- output ratio in the X sector
a_{KY}	: Capital-output ratio in the Y sector
θ_{ij}	: Distributive share of the i input in the j sector, i = L_a, L_c, K and j = X,Y
λ_{ij}	: Proportion of the i input employed in the jth sector, i= L_a, L_c, K and j = X,Y
P_i	: World price of the i good, i = X,Y
t	: Ad-valorem tariff rate on the export of X
W^A	: Adult wage rate
$W^C = \left(\dfrac{W^A}{\hat{a}}\right)$	: Child wage rate
r	: Rate of return on capital
L	: Adult labour endowment
L_C^S	: Aggregate supply of child labour
K	: Capital stock of the economy
X	: Domestic production of exportable
Y	: Domestic production of importable.

The General Equilibrium Analysis

Given the assumptions of perfectly competitive markets, the following equations display the zero profit conditions for the economy:

$$a_{LaX}W^A + a_{LcX}(W^A/\beta) = P_X \tag{1}$$

$$a_{Lay}W^A + a_{KY}\,r = P_y \tag{2}$$

Child and adult labour are two different factors of production with different wage rates, W^A and W^A/b.

The full employment conditions for the economy are:

$$a_{LaX}X + a_{LaY}Y = L \tag{3}$$

$$a_{LCX}X = L_C^S = L_C^S(W^A, X) \tag{4}$$

$$a_{KY}Y = K \tag{5}$$

In our model we have constructed two separate labour endowment equations instead of using effective labour endowment equation as was attempted by Chaudhary and Gupta.

There are five endogenous variables: W^A, r , X ,Y and L_C^S and five equations (1-5). The parameters in the model are: P_X, P_Y, b , L, K.

We note that the system possesses decomposition property since the unknown input prices W^A (hence W^C) and r can be solved from the price system alone independent of the output system. Once the factor prices are known factor coefficients a_{ij}'s are also known. Y is solved from equation (5). Substituting the value of Y in (3) we shall solve for X. L_C^S Will be solved from (4).

Comparative static exercises

Imposition of trade restrictive policy: In this section we shall discuss the effectiveness of trade restrictive policy on the incidence of child labour. Following Maskus, the impact of stringent trade restriction in our model is captured by an increase in the tariff rate that the rest of the world imposes on the exported product of the small open economy.

For our purpose, Equation (1) is rewritten in the following form -

$$a_{LaX}W^A + a_{LcX}(W^A/\beta) = P_X(1-t) \tag{1a}$$

Effect on factor prices: To find out the impact on factor prices, taking total differentiation of (1a) we get,

$$a_{LaX}dW^A + W^A da_{LaX} + a_{LcX}d(W^A/b) + (W^A/b)da_{LcX} = -P_X dt \tag{6}$$

$$\text{or, } \theta_{LaX}\hat{W}^A + \theta_{LaX}\hat{a}_{LaX} + \theta_{LcX}\hat{W}^A + \theta_{LcX}\hat{a}_{LcX} = -dt \tag{7}$$

Now the cost minimization condition of the producer entails that

$$da_{LcX}/da_{LaX} = -(W^A/W^C)$$

$$\text{or, } W^C da_{LcX} + W^A da_{LaX} = 0$$

$$\text{or, } \theta_{LcX}\hat{a}_{LcX} + \theta_{LaX}\hat{a}_{LaX} = 0 \tag{8}$$

$\therefore$ From (7) we get, $\hat{W}^A(\theta_{LcX} + \theta_{LaX}) = -dt$

$$\text{or, } \hat{W}^A = -dt \ (since \ \theta_{LcX} + \theta_{LaX} = 1) \tag{9}$$

Since, $W^C = (W^A/b)$ (10)

$\therefore$ $dW^C = (1/b)\ dW^A$

$\therefore$ $\hat{W}^C = \hat{W}^A = -dt < 0$ (11)

Differentiating (2) we get,

$$a_{LaY}dW^A + W^A da_{LaY} + a_{KY}dr + r\ da_{KY} = 0$$

or, $\theta_{LaY}\hat{W}^A + \theta_{LaY}\hat{a}_{LaY} + \theta_{KY}\hat{r} + \theta_{KY}\hat{a}_{KY} = 0$ (12)

From condition of cost minimization,

$$\theta_{LaY}\hat{a}_{LaY} + \theta_{KY}\hat{a}_{KY} = 0$$ (13)

From (12) we can write,

$$\theta_{LaY}\hat{w}^A + \theta_{KY}\hat{r} = 0$$

Or $\hat{r} = (\theta_{LaY}/\theta_{KY})\ dt > 0$ (14)

Proposition 1:

Due to the imposition of trade restriction on the exported product of the small open economy by the rest of the world both adult and child workers will be adversely affected and capital owners will gain.

The intuitive explanation behind proposition 1 is straightforward: Due to fall in effective producer's price in the exportable sector they will offer less to the factors of production engaged in the sector. It indicates a shock in labor (both adult and child) market. On the other hand, the price of import competing good remains unchanged. Hence to ensure normal profit producers must pay more to the capital owners.

Effect on composition of output: We shall now try to find out the impact on output of various sectors due to restrictive trade policy.

In the specific factor model,

$$a_{L_aY}^{\wedge} = -\theta_{KY}\sigma_Y\left(\hat{w}^A - \hat{r}\right) > 0$$

$$a_{KY}^{\wedge} = \theta_{L_aY}\sigma_Y\left(\hat{w}^A - \hat{r}\right) < 0$$ (15)

Where s_Y=Elasticity of substitution$=(\hat{a}_{KY} - a_{L_aY}^{\wedge})/(\hat{w}^A - \hat{r})$

Differentiating (5) we get,

$$\hat{Y} = -\hat{a}_{KY} = -\theta_{LaY}\sigma_Y(\hat{W}^A - \hat{r}) > 0$$ (16)

Thus the import competing sector will expand.

Now differentiating (3) we get,

$$Xda_{LaX} + a_{LaX}dX + Yda_{LaY} + a_{LaY}dY = dL$$

or, $\lambda_{LaX}\hat{a}_{LaX} + \lambda_{LaX}\hat{X} + \lambda_{LaY}\hat{a}_{La} + \lambda_{LaY}\hat{Y} = 0$

or, $\hat{X} = \sigma_Y(\hat{W}^A - \hat{r})(\lambda_{LaY}/\lambda_{LaX}) < 0\ [\hat{a}_{LaX} = 0]$ (17)

Thus the output of the export sector will contract.

Proposition 2:

Due to imposition of trade restriction by rest of the world on the

exported product of the small open economy, export sector will contract and the import competing sector will expand.

The intuitive explanation can be given as follows: To produce per unit Y now less unit of capital will be required. This is obvious because capital has become more costly as rental rate has increased. Now capital is specific in Y production. So full employment of capital must result in higher output of Y and to support the additional production of Y more unit of adult labour will be switched from X to Y production. Thus we can say that the export sector will contract. Alternatively, as there is fall in effective producer's price, so producers of X will be less willing to produce the commodity. Hence, there will be fall in output of X.

Effect on child labour supply: The child labour supply function of the economy is

$$L_C^S = L_C^S(W^A, X),$$

$$\frac{\partial L_C^S}{\partial W^A} < 0, \frac{\partial L_C^S}{\partial X} > 0$$ (18)

Higher is the adult wage ratio lower will be the tendency of the adult workers to send their children to job market. Alternatively, as more and more adult workers will be engaged in export sector of the economy, child labour supply will increase.

Now we want to investigate the impact of trade restrictive policy on child labour supply of the economy. For this purpose, taking total differentiation of (4) we get

$$dL_C^S = \frac{\partial L_C^S}{\partial W^A}dW^A + \frac{\partial L_C^S}{\partial X}dX$$

If $\left|\frac{\partial L_C^S}{\partial W^A}dW^A\right| > \left|\frac{\partial L_C^S}{\partial X}dX\right|$ (19)

There is a scope for Trade Restrictive Policy to enhance the child labour supply of the economy even though it is designed to eradicate the phenomenon.

Proposition 3: *Trade Restrictive Policy may lead to unfavorable impact on child labor supply.*

Lower adult wage will motivate parents to send more of their siblings to the job market. On the contrary, export loan on child labour produced. Product will discourage the expansion of export section. This in turn will reduce the child labour supply. Hence, no definite conclusion can be drawn on the impact of child labour supply.

Imposition of non-trade policy- economic expansion: Non Trade Policy in our model is captured by economic expansion. Suppose Govt. encourages economic expansion via increase in domestic capital stock. Even though the policy is not directly aimed at curtailment of child labour incidence but the policy can have an impact on the child labour incidence.

Effect on factor prices: As the size of the capital stock of the economy swells up the factor prices remain unaffected due to the decomposition property of the system.

Proposition 4: *Economic expansion by increase in domestic capital stock will not lead to any change in factor prices.*

There will be no change in the price of the non-traded good since there will be no change in factor prices.

Effect on composition of output: To find out the impact of output of different sectors, taking total differentiation of equation (5) we get,

$$a_{KY}d\,Y = dK$$

$$\text{or, } dY = \frac{1}{a_{KY}}dK > 0$$

$$\text{or , } \frac{dY}{Y} = \frac{dK}{K} \left(\because a_{KY} = \frac{K}{Y} \right)$$

$$\text{or, } \hat{Y} = \hat{K} > 0 \tag{20}$$

Proposition 5: *Capital expansion will lead to enhance the size of the import competing sector.*

Capital is treated as specific factor in import competing sector of the economy and there is no change in requirement of capital in per unit Y production $(\because \hat{a}_{K} = 0)$. Hence, full utilization of the expanded capital stock must lead to an expansion of the import competing sector.

To find out the impact on output of export sector we differentiate equation (3) and we get,

$$a_{LaX}dX = a_{La}{}^{Y}dY$$

$$dX = -\frac{a_{L_aY}}{a_{L_aX}}dY$$

$$\hat{X} = -\frac{\lambda_{L_aY}}{\lambda_{L_aX}}\hat{Y} < 0 \tag{21}$$

Hence the export sector will shrink.

Proposition 6: *Economic Expansion via an increase in domestic capital stock will result in an adverse shock on the export sector of the economy.*

As the import competing sector expands, more adult laborers will be switched from the export sector as there is no unemployment in adult labour market. Hence, production of exportable will fall.

Effect on child labour supply: Since factor prices are unaffected due to economic expansion,

$$\text{we can write, } dL_C{}^S = \frac{\partial L_C{}^S}{\partial X}dX < 0 \tag{22}$$

Hence, child labour supply of the economy will fall.

Proposition 7: *Economic Expansion will effectively curtail the child labour supply of an economy.*

Child Labour is used only in exportable sector. Contraction of this sector will curtail the magnitude of child labour incidence of an economy.

Conclusion

The goal of the total abolition of child labour is beyond the immediate reach of most countries. Some might even despair that this objective of the total elimination of child labour is of limited use because it is too long run in character. However, the goal of child labour abolition is itself a strong guiding principle in policy decisions. Correctly, it can be said that progress towards the reduction in child labour is being made if there is a revival of sustained economic growth; the pattern of growth is more egalitarian; the modern sector is expanding rapidly; compulsory schooling, particularly of woman is universal; adult literacy programs should be launched;

Since the socio-economic policies will only bear results in the long term, there is a need for reinforcing these broad measures by additional action directly targeting working children as is being done, for instance, by the ILO's International Program on the Elimination of Child Labour (IPECL). Legislation and enforcement of child labour laws beyond the formal sector, where the vast majority of the working children are to be found, is often impractical and costly. Despite their long term significance, it is clear that the socio-economic policies are key solution to the problem of child labour, simply because of their significant economy wide influence on the root cause of child labour. Finally, it can be said that a country's full commitment to the total abolition of child labour should be judged not merely on the basis of official pronouncements but on whether the child labour objective is consciously considered in the above outlined social and economic policy framework. For instance, to realize the commitment made to the adoption of time-bound programs for the elimination of child labour at both the 1997 Amsterdam and Oslo international conferences on child labour, practical action and standard setting will have to be combined with policies which address the root causes of child labour. In this chapter two alternative policies have been analyzed – one is protectionist trade policy where the impact of increased protectionism in import competing sector has been analyzed. Another is economic expansion. The chapter reflects that child labour problem can be reduced by adopting policies favorable to economic growth. A ban on child labour is not necessary.

Appendix 1

In specific factor model we will prove that

$$\hat{a_{L_aY}} = -\theta_{KY}\sigma_Y(\hat{W^A} - \hat{r}) > 0$$

$$\hat{a_{KY}} = \theta_{L_aY}\sigma_Y(\hat{W^A} - \hat{r}) < 0$$

Where,

$\sigma_Y =$ Elasticity of substitution

$$= \left(\frac{\hat{a_{KY}} - \hat{a_{L_aY}}}{\hat{W^A} - \hat{r}} \right)$$

Proof: The zero profit conditions for the economy is shown by the following two equations:

$$a_{LCX}\left(\frac{W^A}{\beta}\right) + a_{L_aX}W^A = Px \tag{1}$$

$$a_{L_aY}W^A + a_{KY}r = P_Y \tag{2}$$

Cost minimization condition for the producer of Y entails that

$$\frac{da_{KY}}{da_{L_aY}} = -\frac{W^A}{r} \tag{3}$$

$$\text{or, } rda_{K} + W^A d_{L_aY} = 0$$

$$\text{or, } \theta_{KY}\hat{a_{KY}} + \theta_{L_a}da_{L_aY}^{\wedge} = 0 \tag{4}$$

$$\text{Now, } \sigma_Y = \frac{\hat{a_{KY}} - \hat{a_{L_aY}}}{\hat{W^A} - \hat{r}}$$

$$\therefore a_{KY}^{\wedge} = \sigma_Y\left(\overset{\wedge}{W^A} - \hat{r}\right) + a_{L_aY}^{\wedge} \tag{5}$$

Substituting the value of $a_K^{\wedge}$ in (4) we get,

$$\theta_{L_aY}a_{L_aY}^{\wedge} + \theta_{KY}a_{L_aY}^{\wedge} + \theta_{KY}\sigma_Y\left(\overset{\wedge}{W^A} - \hat{r}\right) = 0$$

or, $a_{L_aY}^{\wedge} = -\theta_{KY}\sigma_Y\left(\overset{\wedge}{W^A} - \hat{r}\right)$

$\therefore$ From (5), $a_{KY}^{\wedge} = \left(1 - \theta_{KY}\right)\sigma_Y\left(\overset{\wedge}{W^A} - \hat{r}\right)$

$$= \theta_{L_aY}\sigma_Y\left(\overset{\wedge}{W^A} - \hat{r}\right) \tag{6}$$

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