

EFFECT OF GLOBALIZATION ON REAL WAGE IN PRESENCE OF AGRICULTURAL DUALISM IN DEVELOPING ECONOMIES: A THEORETICAL ANALYSIS

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ABSTRACT

Globalization can generate enormous benefit. If properly reaped, it would improve social welfare. However, it also unleashes forces which can adversely affect the lives of families that survive at margins. In the paper we explore whether foreign capital inflow in presence of full capital mobility and change in price of modern agricultural sector heightens the vulnerability of people surviving with meager avenues by adversely affecting the real wage measured in unit of food. In the present paper we also explore whether increase in price of modern agricultural sector products, quantum jump in capital leads to immiserisation. A general equilibrium structure incorporating dichotomized agriculture has been used for our exploration. In the present paper we have shown that inputs used, factor specificity of inputs and factor intensity ranking motivates the results.

Index Terms: Globalization, Real Wage, Agricultural Dualism, Factor Intensity Ranking, Multiple Cross Effect

JEL CLASSIFICATION: F6, Q1, 01

Section 1: Introduction

Globalization can generate enormous benefit. If properly reaped, it would improve social welfare. However, it also unleashes forces which can adversely affect the lives of families that survive at margins. In the paper we explore whether inflow of FDI and agricultural trade liberalization heightens the vulnerability and reduces welfare of people surviving with meager avenues by adversely affecting the real wage measured in unit of food. It is to be noted that a major aspect of vulnerability is food insecurity which can be linked to real wage measured in units of food items.

First, we consider the importance of the real wage in context of food security. FAO studies reveal that household food security would exist only when the capability to access food is present. Household access to food is generated through its own production. Access can also be generated through income-generating activities, ownership of assets and transfers of resources from government. What is to be noted is that even though the relative importance of various resources can be different for different households, the command over these resources must be adequate over time to enjoy enough food on a continual basis. According to FAO, household food security is said to exist when adequate effective demand for food exists. Lipton (1983) Deaton and

Dreze(2002) Sharma Dev (2010) conclude that an operational measure of short-term effective demand which effectively indicates household economic access to food is the real wage.

There is an extensive literature in the general equilibrium framework focusing on determinants of income inequality in developing countries. In this context we may refer to the works of Feenstra and Hanson (1996), Marjit (2003), Marjit, Beladi and Chakrabarti (2004), Marjit and Kar (2005), Chaudhuri and Yabuuchi (2007), Chaudhuri (2007), Beladi, Chaudhuri and Yabuuchi (2008), Chaudhuri (2008) among others. However, the effect of an upward movement in price of modern agricultural goods and capital market liberalization on the real wage measured in unit of food in presence of a non traded traditional agricultural sector and full capital market liberalization has not been addressed in the existing literature. The objective of this paper is to address this particular issue. We now begin with the description of the agricultural sector of the developing economies.

In the globalised world the agricultural sector is dichotomized between new agricultural sector and old agricultural sector. The two agricultural subsectors use different inputs and the consumption pattern of these final goods is also different. World Development Report 2008, highlights that the modern agricultural sector produce export items. The report has also pointed out that emerging pattern of trade indicates that traditional agricultural produce has on many occasions become non-traded.

We now turn our attention to foreign direct investment in developing economies. Inflow of foreign capital represents a quantum jump in availability of capital. FDI inflow in developing economies accounted for above 50 per cent of global FDI inflows in 2014. World Investment Report 2015, Reforming International Investment Governance has highlighted that five of the top 10 economies which have witnessed inflow of foreign capital are developing countries. FDI inflows to Asia increased by 9 per cent in 2014 and it constituted a large share of total FDI to developing economies. In India the total FDI in 2014 is 34.4 billion dollars (representing an increase of 22%). Policy efforts to revitalize the manufacturing sector would further initiate FDI inflow into the manufacturing sector. Moreover, 100% FDI has been allowed through the automatic route into selected sectors like Horticulture, Floriculture, Animal Husbandry and allied sectors to name a few.

The organization of the paper is now given. In section 2, we have presented the model. In section 3 we explore nexus between FDI inflows, rise in price of modern agricultural sector product and real wage measured in unit of food. In section 4 we have explored the welfare consequences of the globalization policies. In Section 5 we conclude the paper.

Section 2: Model with Full Capital Mobility

In the present paper we have considered an economy which consists of three sectors. The sectors under consideration are as follows. We consider sector X to be the import competing manufacturing sector. Y is considered to be a non traded traditional agricultural sector. It produces wage goods. Z is considered to be export oriented modern agricultural sector.

The factors of production of Sector X are labour and capital. Factors used in Sector Y are labour and land. In Sector Z labour, capital and land is used. Labour is mobile between all the sectors while capital is also mobile between the sectors X and Z. Labour and capital are assumed to be substitutes. On the other hand, land is required in fixed proportions. Domestic capital and foreign capital are also assumed to be substitutes. The idea

of capital market liberalization can be expressed as interest rate equalization. In the beginning, the domestic interest rate is endogenously determined and is higher compared to the world rate of interest. With the advent of full capital mobility, there is a possibility that the home rate of interest will be equal to world rate of interest. As the cost of investing in a foreign country is more compared to the cost of investing in home country, countries trying to attract foreign direct investment outweigh the country specific risk with a country specific risk premium. In times of globalization, the policymakers of developing countries have improved quality of institutions, have ensured enforcement of stringent norms and have embarked upon transparent regulatory mechanisms. The effect of the new policies improves investors' conception of country specific risk, attracting FDI and also reducing country specific risk premium.

Notations:

a_{lx} = labour used to produce one unit of product in Sector X

a_{ly} = labour used to produce one unit of product in the Sector Y

a_{lz} = labour used to produce one unit of product in the Sector Z

a_{kx} = capital used to produce one unit of product in sector X

a_{kz} = capital used to produce one unit of product sector Z

a_{tz} = land used to produce one unit of product in sector Z

a_{ty} = land used to produce one unit of product in sector Y

w=wage R=Return on land

r^* = world rate of interest

L= Total labour

T= Total land

P_x^*, P_y, P_z^* = prices of sectors X, Y, Z respectively

θ_{ij} = distributive share of ith input in jth sector

λ_{ij} = proportion of ith input in jth sector

\hat{v} = Proportionate change in variable v

r= domestic interest rate

τ = Country specific risk premium

U=Utility

Due to the assumption of perfectly competitive markets, the usual price- unit cost equality conditions are:

$$a_{lx} \cdot w + a_{kx} \cdot r = P_x^* \dots (1)$$

$$a_{ly} \cdot w + a_{ty} \cdot R = P_y \dots (2)$$

$$a_{lz} \cdot w + a_{kz} \cdot r + a_{tz} \cdot R = P_z^* \dots (3)$$

Where,

$r = r^* + \tau$, i.e., r^* is given in the international capital market and the risk premium τ is exogenous. Thus, r is parametrically given.

As the model is a full employment model, the endowment equations are:.

$$a_{lx} \cdot X + a_{ly} \cdot Y + a_{lz} \cdot Z = L \dots\dots (4)$$

$$a_{ly} \cdot Y + a_{lz} \cdot Z = T \dots\dots\dots (5)$$

Next, we consider equilibrium condition for non traded good. The demand for non traded sector is obtained by using Sheppard’s Lemma.

Let $E(P_x^*, P_y^*, P_z^*, U)$ be the expenditure function with all its standard properties. According to Sheppards Lemma::

$$\frac{\delta E(P_x^*, P_y^*, P_z^*, U)}{\delta P_y} = \text{Demand for } Y = Y_d$$

Given concavity of the expenditure function we have $\frac{\delta Y_d}{\delta P_y} = \frac{\delta^2 E(P_x^*, P_y^*, P_z^*, U)}{\delta P_y^2} < 0 \dots(6)^1$

The demand supply equality for non traded sector is::

$$\frac{\delta E(P_x^*, P_y^*, P_z^*, U)}{\delta P_y} = Y_d = Y_s \dots\dots (7),$$

Where U= Utility

Wage rate of labourers is solved from equation (1). From equation (3) we solve for the rent. Equation (2) determines price of traditional agricultural produce. The traditional agricultural sector produce determined from equation (7). Equations (4) and (5) help in solving for amount of production in the manufacturing sector and the modern agricultural sector.

Section 3: Effect of change in selected globalization policies on real wage

Decrease in risk premium of a country and Consequent changes

Since, $r = r^* + \tau$, $\hat{r} = \frac{r}{\tau} \hat{\tau}$

Differentiating equations (1) to (7) with respect to r we have:

$$\hat{w} = -\frac{\theta_{kx}}{\theta_{lx}} \frac{r}{\tau} \hat{r} \dots\dots (8)$$

$$\hat{R} = -\hat{r} \frac{r}{\tau} \frac{1}{\theta_{tz}} [-\theta_{tz} \theta_{kx} + \theta_{lx} \theta_{kz}] \frac{1}{\theta_{lx}} \dots\dots (9)$$

$$\hat{X} = \frac{r}{\tau} \frac{\hat{r}}{\lambda_{lx}} [-A_4 (1 + \frac{\theta_{kx}}{\theta_{lx}}) - \frac{P_y}{Y} \frac{\delta^2 E}{\delta P_y^2} (\lambda_{ly} - \frac{\lambda_{lz} \lambda_{ty}}{\lambda_{tz}}) \frac{\theta_{ty}}{\theta_{tz}} C_4] \dots\dots(10)$$

$$\hat{Y} = \frac{P_y}{Y} \frac{\delta^2 E}{\delta P_y^2} \hat{r} \frac{r}{\tau} [-\theta_{ly} \frac{\theta_{kx}}{\theta_{lx}} - \frac{\theta_{ty}}{\theta_{tz} \theta_{lx}} [-\theta_{tz} \theta_{kx} + \theta_{lx} \theta_{kz}]] \dots\dots(11)$$

$$\hat{Z} = -\frac{\lambda_{ty}}{\lambda_{tz}} \{ \frac{P_y}{Y} \frac{\delta^2 E}{\delta P_y^2} \hat{r} \frac{r}{\tau} [-\theta_{ly} \frac{\theta_{kx}}{\theta_{lx}} - \frac{\theta_{ty}}{\theta_{tz} \theta_{lx}} [-\theta_{tz} \theta_{kx} + \theta_{lx} \theta_{kz}]] \} \dots\dots(12)$$

¹ Since the expenditure function is concave in prices, Hicksian demand curve is downward sloping.

$$\hat{P}_y = \hat{r} \frac{r}{\tau} [-\theta_{ly} \frac{\theta_{kx}}{\theta_{lx}} - \frac{\theta_{ly}}{\theta_{lz} \theta_{lx}} [-\theta_{lz} \theta_{kx} + \theta_{lx} \theta_{kz}]] \dots (13)$$

$$\hat{r} = \hat{\tau} \frac{\tau}{r}$$

$$A_4 = [\lambda_{lx} \sigma_{l,k}^x (1 - \theta_{lx}) + \lambda_{lz} \theta_{kz} \frac{1}{\theta_{lz} + \theta_{kz}} \sigma_{l,k}^z]$$

$$C_4 = -\frac{\theta_{lz} \theta_{kx} \theta_{ly}}{\theta_{lx} \theta_{ry}} + \frac{\theta_{lz} \theta_{kx}}{\theta_{lx}} - \theta_{kz}$$

Proposition 1: If there is a decrease in interest risk premium real wage measured in unit of food decreases if the modern agriculture is capital intensive compared to the manufacturing sector.

Explanation: From equation (1) we find that as risk premium decreases, money wage goes up. Decrease in risk premium would affect equation (3). If modern agricultural sector is capital intensive compared to the traditional manufacturing sector, a decrease in risk premium would increase the rental on land. The logic is this. From equation (3) we find that $\theta_{lz} \cdot \hat{w} + \theta_{kz} \cdot \hat{r} + \theta_{lz} \cdot \hat{R} = 0$. Since, the modern agricultural sector uses capital more intensively compared to the traditional manufacturing sector, $\theta_{lz} \cdot \hat{w} + \theta_{kz} \cdot \hat{r}$ falls. To maintain equilibrium in equation (3), rent rises.

Since, both wage and rent on land rise, price of traditional agricultural sector also increases.

It follows from equations (7), (8) and (13) that

$$\hat{w} - \hat{P}_y = -\frac{\hat{r}}{\theta_{lz} \theta_{lx}} \frac{r}{\tau} \theta_{ly} (\theta_{kx} - \theta_{kz}) \dots (14)$$

If modern agricultural sector uses capital intensively compared to the manufacturing sector, we find that real wage measured in unit of food decreases. This requires a careful interpretation. Despite an increase in money wage, real product wage in unit of traditional agricultural good decreases. This can be attributed to the fact that the rise in price of traditional agricultural commodities decreases the command of workers over basic food items. We can thus conclude that if the modern agricultural sector uses capital intensively compared to the traditional manufacturing sector, workers command over food items (measured in terms of real wage in unit of food) decreases.

Proposition 2: In wake of fall in risk premium, production of the traditional agricultural item falls and the modern agricultural sector expands. The manufacturing sector expands.

Explanation: An upward movement in price of non traded sector leads to fall in demand and hence leads to excess supply. To maintain commodity market equilibrium, supply of traditional agricultural item thus falls. Following the Rybzynski argument, modern agricultural sector expands. What happens to the manufacturing sector is of importance. The modern agricultural sector requires capital for production. Hence, increase in supply of this sector reduces capital availability to the manufacturing sector. If traditional agricultural sector use labour intensively compared to the modern agricultural sector; labour released from this sector is in excess to that required by the modern agricultural sector. This excess labour promotes production in the manufacturing sector. If manufacturing sector uses labour intensively compared to the modern agricultural sector, manufacturing sector expands.

We capture the notion of agricultural trade liberalization by rise in price of modern agricultural goods. Liberalization of agriculture, leads to increased market access and hence they demand higher price.

Differentiating equations (1)-(6) with respect to P_z^* we have:

$$\hat{w} = 0 \dots (15)$$

$$\hat{R} = \frac{1}{\theta_{tz}} \hat{P}_z^* \dots (16)$$

$$\hat{X} = \left\{ \hat{P}_z^* \frac{P_y}{Y} \frac{\theta_{ty}}{\theta_{tz}} \frac{\delta^2 E}{\delta P_y^2} + \frac{P_z^*}{Y} \frac{\delta^2 E}{\delta P_y \delta P_z^*} \hat{P}_z^* \right\} \left\{ \left(\lambda_{ty} - \frac{\lambda_{tz} \lambda_{ty}}{\lambda_{tz}} \right) \right\} \dots (17)$$

$$\hat{Y} = \hat{P}_z^* \frac{P_y}{Y} \frac{\theta_{ty}}{\theta_{tz}} \frac{\delta^2 E}{\delta P_y^2} + \frac{P_z^*}{Y} \frac{\delta^2 E}{\delta P_y \delta P_z^*} \hat{P}_z^* \dots (18)$$

$$\hat{Z} = -\frac{\lambda_{ty}}{\lambda_{tz}} \left[\frac{P_y}{Y} \hat{P}_z^* \frac{\theta_{ty}}{\theta_{tz}} \frac{\delta^2 E}{\delta P_y^2} + \frac{P_z^*}{Y} \frac{\delta^2 E}{\delta P_y \delta P_z^*} \hat{P}_z^* \right] \dots (19)$$

$$\hat{P}_y = \theta_{ty} \frac{1}{\theta_{tz}} \hat{P}_z^* \dots (20)$$

Proposition 3: Following agricultural trade liberalization, real wage measured in unit of food falls

Explanation: From equation (1) we conclude that wage rate of workers remain unchanged. From equation (3) we find that as price of nontraditional agricultural sector produce increases, landowners receive a higher return. From equation (2) we conclude that price of traditionally agricultural commodity rises. From equations (15), (20) we find that:

$$\hat{w} - \hat{P}_y = -\theta_{ty} \frac{1}{\theta_{tz}} \hat{P}_z^* \dots (21)$$

Though money wage remains unchanged, real product wage in unit of traditional agricultural good falls. This is because of the fact that price of traditional agricultural sector increases and decreases workers command over basic food items.

Proposition 4: Following Agricultural trade liberalization, traditional agricultural sector expands if:

$$\frac{P_y}{Y} \frac{\theta_{ty}}{\theta_{tz}} \frac{\delta^2 E}{\delta P_y^2} + \frac{P_z^*}{Y} \frac{\delta^2 E}{\delta P_y \delta P_z^*} > 0.$$

Explanation: We have seen from the preceding proposition that price of non traded sector rises. A rise in price of non traded sector would lead to a fall in demand for traditional item and lead to excess supply. However, rise in price of modern agricultural product has a positive effect on the demand for traditional agricultural product. If the positive effect on demand outweighs the negative effect on demand, supply of traditional agricultural product increases.

Following the Rybzynski argument modern agricultural sector contracts. What happens to the manufacturing sector is of importance. If traditional agricultural sector uses labour intensively compared to the modern agricultural sector; labour required by this sector is more compared to that released by the modern agricultural

sector. Hence, additional labour is released from manufacturing sector. Given, manufacturing sector uses labour intensively compared to the modern agricultural sector, manufacturing sector contracts.

Section 4: Effect on Welfare

We concentrate on the effect on welfare.

Proposition 5: A possibility of immiserisation exists in case decrease in country specific risk premium and also in case of agricultural trade liberalization.

Explanation:

Total Expenditure on X, Y, Z at domestic prices is equal to Value of production at domestic prices net of interest income which is sent back. Using this concept we get²:

$$E[P_x^*, P_y, P_z^*, U] = P_x^* X + P_y Y + ZP_z^* - rK_f \dots (22)$$

Where K_f = Foreign capital

U=Utility

$$\frac{\delta E}{\delta U} > 0, \frac{\delta E}{\delta P_y} > 0, \frac{\delta E}{\delta P_z^*} > 0, \frac{\delta E}{\delta P_x^*} > 0$$

We would first concentrate how welfare changes if there is a decrease in risk premium Differentiating equation (22) with respect to rate of interest we have,

$$\frac{\delta E}{\delta P_y} P_y \hat{P}_y + \frac{\delta E}{\delta U} dU = P_x^* X \hat{X} + P_z^* Z \hat{Z} + P_y Y \hat{Y} + Y P_y \hat{P}_y - K_f dr \dots (23)$$

Manipulating equation (23) we have:

$$dU = \frac{1}{\frac{\delta E}{\delta U}} \left\{ P_x^* X \frac{r}{\tau} \hat{r} \frac{1}{\lambda_{lx}} [-A_4 (1 + \frac{\theta_{kx}}{\theta_{lx}}) - \frac{P_y}{Y} \frac{\delta^2 E}{\delta P_y^2} (\lambda_{ly} - \frac{\lambda_{lz} \lambda_{ly}}{\lambda_{tz}}) \frac{\theta_{ly}}{\theta_{tz}} C_4] \right. \\ \left. + \hat{r} \frac{P_y}{Y} \frac{\delta^2 E}{\delta P_y^2} \frac{r}{\tau} [-\theta_{ly} \frac{\theta_{kx}}{\theta_{lx}} - \frac{\theta_{ly}}{\theta_{tz} \theta_{lx}} [-\theta_{lz} \theta_{kx} + \theta_{lx} \theta_{kz}]] [\frac{P_y Y}{\tau} + P_z^* Z (-\frac{\lambda_{ly}}{\lambda_{tz}})] + \right. \\ \left. P_y (Y - \frac{\delta E}{\delta P_y}) \hat{r} \frac{r}{\tau} [-\theta_{ly} \frac{\theta_{kx}}{\theta_{lx}} - \frac{\theta_{ly}}{\theta_{tz} \theta_{lx}} [-\theta_{lz} \theta_{kx} + \theta_{lx} \theta_{kz}]] \right\} - K_f dr$$

Production of the traditional agricultural item falls and the modern agricultural sector expands following fall in risk premium. Manufacturing sector expands. That is, post decrease in risk premium, value of production of the traditional agricultural sector measured at domestic prices fall. The decrease in value of production suppresses welfare. However, value of production of the manufacturing product and the modern agricultural product at domestic prices increase. This in turn increases welfare. Hence, two opposite effects act on the value of production. On the other hand, interest income repatriated back home reduces. This increases welfare.

² See Ethier (1988)

It follows from Sheppards Lemma, that $\frac{\delta E}{\delta P_y}$ is demand for traditional agricultural product and Y represents supply of traditional agricultural product. Since, the good is non traded, $(Y - \frac{\delta E}{\delta P_y}) = 0$

$$\text{and hence: } P_y (Y - \frac{\delta E}{\delta P_y}) \hat{r} \frac{r}{\tau} [-\theta_{ly} \frac{\theta_{kx}}{\theta_{lx}} - \frac{\theta_{ly}}{\theta_{tz} \theta_{lx}} [-\theta_{lz} \theta_{kx} + \theta_{lx} \theta_{kz}]] = 0$$

Hence, we notice various cross effects act on welfare. If the welfare depressing effect is larger than the welfare improving effects, immiserisation results. Sufficient condition for immiserisation is:

$$\begin{aligned} & \{ P_x^* X \frac{r}{\tau} \hat{r} \frac{1}{\lambda_{lx}} [-A_4 (1 + \frac{\theta_{kx}}{\theta_{lx}}) - \frac{P_y}{Y} \frac{\delta^2 E}{\delta P_y^2} (\lambda_{ly} - \frac{\lambda_{lz} \lambda_{ly}}{\lambda_{tz}}) \frac{\theta_{ly}}{\theta_{tz}} C_4] \\ & + \hat{r} \frac{P_y}{Y} \frac{\delta^2 E}{\delta P_y^2} \frac{r}{\tau} [-\theta_{ly} \frac{\theta_{kx}}{\theta_{lx}} - \frac{\theta_{ly}}{\theta_{tz} \theta_{lx}} [-\theta_{lz} \theta_{kx} + \theta_{lx} \theta_{kz}]] [\frac{P_y Y}{P_z^*} + Z (-\frac{\lambda_{ly}}{\lambda_{tz}})] \\ & - K_f dr < 0 \dots (24) \end{aligned}$$

We now turn to the effect of agricultural trade liberalization. Differentiating equation (22) with respect to price of modern agricultural sector produce we have:

$$\frac{\delta E}{\delta P_y} \frac{dP_y}{dP_z^*} + \frac{\delta E}{\delta U} \frac{dU}{dP_z^*} + \frac{\delta E}{\delta P_z^*} = P_x^* \frac{\delta X}{\delta P_z^*} + Y \frac{\delta P_y}{\delta P_z^*} + P_y \frac{\delta Y}{\delta P_z^*} + Z + P_z^* \frac{\delta Z}{\delta P_z^*} \dots (24)$$

Manipulating equation (24) we have:

$$\frac{dU}{dP_z^*} = \frac{1}{\delta E} [\{ \frac{P_y \theta_{ly}}{Y \theta_{tz}} \frac{\delta^2 E}{\delta P_y^2} + \frac{P_z^*}{Y} \frac{\delta^2 E}{\delta P_y \delta P_z^*} \} \{ \frac{P_x^* X}{P_z^*} (\lambda_{ly} - \frac{\lambda_{lz} \lambda_{ly}}{\lambda_{tz}}) + P_y Y \frac{1}{P_z^*} - Z \frac{\lambda_{ly}}{\lambda_{tz}} \} + Z + (-\frac{\delta E}{\delta P_y} + Y) \frac{P_y}{P_z^*} \frac{\theta_{ly}}{\theta_{tz}} - \frac{\delta E}{\delta P_z^*}]$$

Following Agricultural trade liberalization traditional agricultural sector expands and modern agricultural sector contracts whereas the manufacturing sector contracts. Fall in the level of the modern agricultural sector and the manufacturing sector reduces value of production measured at domestic prices and in the process reduces welfare. However, rise in production of the traditional agricultural product raises value of production and hence increases welfare.

It follows from the fact that from Sheppards Lemma, that $\frac{\delta E}{\delta P_y}$ is demand for traditional agricultural product

and Y represents supply of traditional agricultural product. Since, the good is non traded, $(Y - \frac{\delta E}{\delta P_y}) = 0$.

$$\text{Thus, } (-\frac{\delta E}{\delta P_y} + Y) \frac{P_y}{P_z^*} \frac{\theta_{ly}}{\theta_{tz}} = 0$$

We should also note that from Sheppard's Lemma: $\frac{\delta E}{\delta P_z^*}$ is demand for modern agricultural product and Z

denotes it's supply. Since the good is export oriented in nature: $[Z - \frac{\delta E}{\delta P_z^*}]$ expresses physical volume of exports

of Z

Thus, we notice various effects counteracting on each other. In the present case sufficient condition for immiserisation is as follows:

$$\left\{ \frac{P_y \theta_{ly}}{Y \theta_{tz}} \frac{\delta^2 E}{\delta P_y^2} + \frac{P_z^*}{Y} \frac{\delta^2 E}{\delta P_y \delta P_z^*} \right\} \left\{ \frac{P_x^* X}{P_z^*} (\lambda_{ly} - \frac{\lambda_{tz} \lambda_{ly}}{\lambda_{tz}}) + P_y Y \frac{1}{P_z^*} - Z \frac{\lambda_{ly}}{\lambda_{tz}} \right\} + [Z - \frac{\delta E}{\delta P_z^*}] < 0$$

Section 5: Conclusion

In the present paper we have focused on effects of FDI and increase in price of modern agricultural produce in a developing country characterized by agricultural dualism.

In this paper we have incorporated full capital mobility. Decrease in domestic rate of interest and increase in price of modern agricultural produce depress real wage measured in unit of food. Multiple cross effects in this three good general equilibrium model are the determining forces behind the results. Increasing real wage is a disturbing global phenomenon in recent times. Policy makers for developing economies should embark upon selected policies of globalization judiciously. The paper can be extended in different directions. We can also introduce different aspects of factor market segmentation such as division between the skilled-unskilled labourers to explore the effect of globalization on real wage of both skilled and unskilled labour.

Mathematical Appendix

Appendix for model in section 2

Decrease in country specific risk premium

From equation (1)

$$\hat{w} = -\frac{\theta_{kx}}{\theta_{lx}} \hat{r} \dots (8)$$

From (.2)) we have:

$$\hat{R} = \hat{P}_y \frac{1}{\theta_y} - \frac{\theta_{ly}}{\theta_y} \hat{w} \dots (a)$$

From (3) we have:

$$\hat{w} = \frac{1}{A} \left(\frac{\theta_{tz}}{\theta_y} \right) \hat{P}_y \dots (b)$$

From the food market equilibrium condition we have:

$$P_y \frac{1}{Y} \frac{\delta^2 E}{\delta P_y^2} \hat{P}_y = \hat{Y} \dots (I)$$

From the factor endowment equations we have:

$$\lambda_{ly}\hat{Y} + \lambda_{lx}\hat{X} + \lambda_{lz}\hat{Z} = -\lambda_{ly}\hat{a}_{ly} - \lambda_{lx}\hat{a}_{lx} - \lambda_{lz}\hat{a}_{lz} \dots (G)$$

$$\lambda_{ly}\hat{Y} + \lambda_{lz}\hat{Z} = 0 \dots (H)$$

With the help of (b), (I), (G), (H) and the fact $\hat{r} = \hat{\tau} \frac{\tau}{r}$

we have the effect on factor prices and output given below

$$\hat{w} = -\frac{\theta_{kx}}{\theta_{lx}} \frac{r}{\tau} \hat{r} \dots (8)$$

$$\hat{R} = -\hat{r} \frac{r}{\tau} \frac{1}{\theta_{lz}} [-\theta_{lz}\theta_{kx} + \theta_{lx}\theta_{kz}] \frac{1}{\theta_{lx}} \dots (9)$$

$$\hat{X} = \frac{r}{\tau} \frac{\hat{r}}{\lambda_{lx}} [-A_4(1 + \frac{\theta_{kx}}{\theta_{lx}}) - \frac{P_y}{Y} \frac{\delta^2 E}{\delta P_y^2} (\lambda_{ly} - \frac{\lambda_{lz}\lambda_{ty}}{\lambda_{tz}}) \frac{\theta_{ty}}{\theta_{tz}} C_4] \dots (10)$$

$$\hat{Y} = \frac{P_y}{Y} \frac{\delta^2 E}{\delta P_y^2} \hat{r} \frac{r}{\tau} [-\theta_{ly} \frac{\theta_{kx}}{\theta_{lx}} - \frac{\theta_{ty}}{\theta_{tz}\theta_{lx}} [-\theta_{lz}\theta_{kx} + \theta_{lx}\theta_{kz}]] \dots (11)$$

$$\hat{Z} = -\frac{\lambda_{ty}}{\lambda_{tz}} \left\{ \frac{P_y}{Y} \frac{\delta^2 E}{\delta P_y^2} \hat{r} \frac{r}{\tau} [-\theta_{ly} \frac{\theta_{kx}}{\theta_{lx}} - \frac{\theta_{ty}}{\theta_{tz}\theta_{lx}} [-\theta_{lz}\theta_{kx} + \theta_{lx}\theta_{kz}]] \right\} \dots (12)$$

$$\hat{P}_y = \hat{r} \frac{r}{\tau} [-\theta_{ly} \frac{\theta_{kx}}{\theta_{lx}} - \frac{\theta_{ty}}{\theta_{tz}\theta_{lx}} [-\theta_{lz}\theta_{kx} + \theta_{lx}\theta_{kz}]] \dots (13)$$

$$\hat{r} = \hat{\tau} \frac{\tau}{r}$$

$$A_4 = [\lambda_{lx}\sigma_{l,k}^x (1 - \theta_{lx}) + \lambda_{lz}\theta_{kz} \frac{1}{\theta_{lz} + \theta_{kz}} \sigma_{l,k}^z]$$

$$C_4 = -\frac{\theta_{tz}\theta_{kx}\theta_{ly}}{\theta_{lx}\theta_{ty}} + \frac{\theta_{lz}\theta_{kx}}{\theta_{lx}} - \theta_{kz}$$

Thus, the model leads to the following propositions.

Agricultural Trade Liberalization

Differentiating equations (1)-(6) with respect to P_z^* we have:

$$\hat{w} = 0 \dots (15)$$

$$\hat{R} = \frac{1}{\theta_{lz}} \hat{P}_z^* \dots (16)$$

$$\hat{P}_y = \theta_{ly} \frac{1}{\theta_{tz}} \hat{P}_z^* \dots (20)$$

From the factor endowment equations we have:

$$\lambda_{ly}\hat{Y} + \lambda_{lx}\hat{X} + \lambda_{lz}\hat{Z} = -\lambda_{ly}\hat{a}_{ly} - \lambda_{lx}\hat{a}_{lx} - \lambda_{lz}\hat{a}_{lz} \dots (G)$$

$$\lambda_{ly}\hat{Y} + \lambda_{lz}\hat{Z} = 0 \dots (H)$$

From the food market equilibrium condition we have:

$$P_y \frac{1}{Y} \frac{\delta^2 E}{\delta P_y^2} \hat{P}_y + P_z^* \frac{1}{Y} \frac{\delta^2 E}{\delta P_y \delta P_z^*} \hat{P}_z^* = \hat{Y} \dots (I)$$

From equations (G), (H), (I) we have:

$$\hat{X} = \hat{P}_z^* \frac{P_y}{Y} \frac{\theta_{ty}}{\theta_{tz}} \frac{\delta^2 E}{\delta P_y^2} + \frac{P_z^*}{Y} \frac{\delta^2 E}{\delta P_y \delta P_z^*} \hat{P}_z^* \left\{ \left(\lambda_{ty} - \frac{\lambda_{tz} \lambda_{ty}}{\lambda_{tz}} \right) \right\} \dots (17)$$

$$\hat{Y} = \hat{P}_z^* \frac{P_y}{Y} \frac{\theta_{ty}}{\theta_{tz}} \frac{\delta^2 E}{\delta P_y^2} + \frac{P_z^*}{Y} \frac{\delta^2 E}{\delta P_y \delta P_z^*} \hat{P}_z^* \dots (18)$$

$$\hat{Z} = -\frac{\lambda_{ty}}{\lambda_{tz}} \left[\hat{P}_z^* \frac{P_y}{Y} \frac{\theta_{ty}}{\theta_{tz}} \frac{\delta^2 E}{\delta P_y^2} + \frac{P_z^*}{Y} \frac{\delta^2 E}{\delta P_y \delta P_z^*} \hat{P}_z^* \right] \dots (19)$$

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