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Abstract: This paper makes a pioneering attempt to provide a theory of determination of interest rate in the informal credit market in a small open economy in terms of a three-sector general equilibrium model. There are two informal sectors which obtain production loans from a monopolistic moneylender and employ labour from the informal labour market. On the other hand, the formal sector employs labour at an institutionally fixed wage rate and takes loans from the competitive formal credit market. We show that an inflow of foreign capital and/or an emigration of labour raises (lowers) the informal (formal) interest rate while lowers the competitive wage rate in the informal labour market when the informal manufacturing sector is more capital-intensive vis-à-vis the agricultural informal sector. International factor mobility, therefore, increases the degrees of distortions in both the factor markets in this case.

Keywords: Informal credit, formal credit, moneylender, foreign capital, emigration, general equilibrium.

JEL classification: D42; F21, F22; O17.

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1. Introduction

There exists a financial dualism in the less developed countries (LDCs) like India, Pakistan and Bangladesh with two different credit markets – formal and informal. The formal capital market is competitive and supplies capital to the organized production sectors of the economy at relatively low rates of interest. On the contrary, the informal credit market is characterized by high degrees of imperfection and makes itself the major source of credit to the unorganized production sectors like agriculture, urban informal sectors etc. Professional moneylenders, having local monopolistic power, charge exorbitantly high rates of interest[1] to their borrowers.

The theoretical literature dealing with the interaction between the formal credit market and informal credit market consists of two types of models. Contributions like Chaudhuri and Gupta (1996), Gupta and Chaudhuri (1997), and Chaudhuri (1998, 2001, 2004) analyze interaction between the two credit markets in the presence of corruption in the loan delivery system in the formal credit market. On the other hand, works like Bose (1998), Hoff and Stiglitz (1996), Floro and Roy (1997), Jain (1999), Chaudhuri and Ghosh Dastidar (2011) etc. consider vertical linkages between the two credit markets where informal sector lenders act as financial intermediaries between the formal credit agency and the final borrowers of credit.

However, models belonging to this area are built in partial equilibrium framework and deal with a pure agrarian economy. A complete model developed in a general equilibrium framework incorporating the interaction between these two credit markets as well as the interdependence between the urban development and the rural development is found in Gupta (1997) which provides a framework to analyze the effect of various urban

[1] The informal interest rate could be as high as 40 per cent or even 120 per cent per annum. See Basu (1998) and Bedbak (1986) in this context.

development policies on the relative development of the two credit markets.[2] However, the model of Gupta (1997) assumes informal capital to be mobile between the urban informal sector and the rural sector and keeps formal capital to remain specific to the urban formal sector. Furthermore, the two capital markets in this model are completely disintegrated and there is no scope for formal credit to flow into the informal credit market. Also quite unrealistically, the informal credit market is assumed to be competitive in that model when there are several theoretical and empirical works emphasizing the imperfection in this credit market.[3] Also the literature does not comprise of any general equilibrium models that provide a theory of determination of the informal interest rate starting from the behaviour of the informal sector lender. This justifies the need for further research in this area introducing imperfection in the informal credit market as well as integration between these two credit markets.

The present paper develops a static general equilibrium model of a small open economy consisting of three sectors - a formal, an informal and a rural (agricultural). The informal sector produces a non-traded intermediate good for the formal sector while the other two sectors produce two internationally traded final commodities. The formal capital market that supplies capital to the formal sector is assumed to be competitive like Gupta (1997). However, we introduce imperfection in the informal credit market that supplies capital to the informal and rural sector producers. Also the two credit markets are not disintegrated and capital can flow from one market to the other. Any inflow of foreign capital necessarily goes to the urban formal sector in Gupta (1997)[4] while in the present model it may flow into both credit markets.

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[2] This treatment of dichotomy between the formal-informal credit markets is also available in Chaudhuri (2003) which studies the welfare consequences of different liberalized economic policies in a small open economy setting.

[3] See for examples, Bhaduri (1977), Bardhan (1984), Bardhan and Rudra (1978), Sarap (1991), Bottomley (1975), Basu (1984, 1998), Basu and Bell (1991), Bell (1988) and Chaudhuri (2004).

[4] Chaudhuri (2003) model also shares the same limitation.

The present analysis derives some interesting results that are new in the literature on agricultural credit. An inflow of foreign capital, given the endowment of labour, unambiguously raises the price of the informal sector's product and the informal interest rate but lowers the formal interest rate and the wage rate in the informal labour market. Similar results are obtained when an emigration of labour takes place given the capital endowment of the economy. So either the foreign capital inflow or the emigration of labour aggravates the extent of formal-informal wage gap as well as the interest rate gap between the two credit markets. So degrees of distortions in both the factor markets are increased following inflows of foreign capital and/or emigration of labour.

The paper is organized as follows. The model is described in section 2. Subsection 2.1 analyzes the behaviour of the monopolistic lender who is the only source of capital in the informal credit market. Subsection 2.2 describes the equational structure of the general equilibrium model. Section 3 presents the comparative static effects with respect to changes in capital and labour endowments. Finally, concluding remarks are made in section 4.

2. The Model

We consider a small open developing economy with three sectors: one formal and two informal. One of the two informal sectors (sector 1) produces an agricultural commodity (X_1) using labour (L) and capital (K) while the other informal sector (sector 2) produces a non-traded intermediate good (X_2) for the formal sector with the help of same two inputs. The formal sector produces a manufacturing commodity (X_3) by means of labour, capital and the non-traded intermediate input. Markets other than the formal sector labour market and the informal sector credit market are perfectly competitive. The representative firm in each of these three sectors maximizes profit. Factor endowments are given exogenously. Labour and capital move freely across different sectors. There are imperfections in the market for labour in the formal sector. Workers in sector 3 are unionized and they receive a high fixed wage, W^*, while their counterparts in the two informal sectors earn only a flexible competitive wage, W with $W^* > W$.[5] Workers first try to get employment in the formal sector as it offers a high wage. Those who are not successful in getting jobs in the formal sector are automatically absorbed in the two informal sector owing to complete flexibility of the informal wage, W. The two informal sectors do not have any access to the formal capital market where the return to capital is r and hence are compelled to fall back upon the informal credit market, monopolized by a moneylender where and the interest rate is denoted by R. The per-unit requirement of the intermediate input in sector 3 is assumed to be technologically fixed.[6,7] Sector 1 and sector 2 together form a Heckscher-Ohlin sub-system (HOSS). Sector 2 uses capital more intensively vis-à-vis sector 1. However, sector 3 is the most capital-intensive sector in the economy. Production functions in all the three sectors exhibit constant returns to scale[8] with positive and diminishing marginal productivity to each factor. Owing to our small open economy assumption, prices of both the final commodities (P_1 and P_3) are given internationally. However, as sector 2 produces a non-traded intermediate good its

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[5] Firms in the formal sector face unionized labour market. One of the most important roles of the labour unions is to bargain with their respective employers in respect of the betterment of the working conditions. Through offer of negotiation, threat of strike, actual strike etc. the trade unions exert pressure on the employers (firms) in order to secure higher wages, reduced hours of work, share in profits and other benefits. Organized workers in large firms leave no stones unturned so as to reap wages higher than their reservation wage i.e. the informal sector wage. See Bhalotra (2002) and Chaudhuri and Mukhopadhyay (2009) in this context.

[6] It rules out the possibility of substitution between the non-traded intermediate good and other factors of production in sector 3. Although this is a simplifying assumption, it is not totally unrealistic. In industries like shoe making and garments, large formal sector firms farm out their production to the small informal sector firms under the system of subcontracting. So the production is done in the informal sector firms while labeling, packaging and marketing are done by the formal sector firms. One pair of shoes produced in the informal sector does not change in quantity when it is marketed by the formal sector as a final commodity. Thus there remains a fixed proportion between the use of the intermediate good and the quantity of the final commodity produced and marketed by the formal sector. See Chaudhuri and Mukhopadhyay (2009) in this context.

[7] Even though the non-traded input-output ratio (a_{23}) in sector 3 is technologically given, labour and capital are substitutes and the production function displays the constant returns to scale property in these two inputs.

[8] See footnotes 6 and 7 in this context.

price, P_2, is determined domestically. Finally, we assume that labour and capital are substitutes to each other in all the sectors. This means that any cross partials of the factor coefficients are positive.

2.1 The moneylender's behaviour

The moneylender, denoted by M, is the only source of informal credit. So he enjoys monopoly power in the informal credit market. He borrows funds from the formal credit market at the interest rate, r, and lends it to the informal sector producers at the interest rate, R. The aggregate demand for informal credit of the moneylender, B, is given by

$$B = a_{K1}(W,R)X_1 + a_{K2}(W,R)X_2 \tag{1}$$

where a_{Ki} and X_i are the capital-output ratio and output level in the ith sector for. $i = 1,2$ W and R stand for the informal wage rate and the informal interest rate, respectively.

The moneylender's net interest income is given by

$$Y_M = (R-r)B = (R-r)[a_{K1}(W,R)X_1 + a_{K2}(W,R)X_2] \tag{2}$$

The monopolist moneylender maximizes his net interest income through a choice of R. The first-order condition of maximization is given by

$$a_{K1}X_1[(1-S^1_{KL}) + \frac{r}{R}S^1_{KL}] + a_{K2}X_2[(1-S^2_{KL}) + \frac{r}{R}S^2_{KL}] = 0 \tag{3}$$

Here S^k_{ji} is the degree of substitution between factor j and factor i in the kth sector, where $j,i = K,L$; and, k = 1,2,3. $S^k_{ji} > 0$ for $j \neq i$; and, $S^k_{jj} < 0$.

From equation (3) we have

$$[\frac{a_{K1}X_1(1+S^1_{KL}) + a_{K2}X_2(1+S^2_{KL})}{a_{K1}X_1(1-S^1_{KL}) + a_{K2}X_2(1-S^2_{KL})}] = -(\frac{2R-r}{r}) < 0 \tag{3.1}$$

So from equation (3.1) it follows that either

$$\left.\begin{aligned}&a_{K1}X_1(1-S_{KL}^1)+a_{K2}X_2(1-S_{KL}^2)<0\,;\\&\text{or,}\\&1\le S_{KL}^1\ \text{ and } 1\le S_{KL}^2\\&\text{with at least one being a strict inequality.}\end{aligned}\right\}\qquad(3.2)$$

2.2 The general equilibrium analysis

The price sub-system of this general equilibrium model is represented by the following set of equations:

$$Wa_{L1}+Ra_{K1}=P_1 \qquad (4)$$

$$Wa_{L2}+Ra_{K2}=P_2 \qquad (5)$$

and,

$$W^*a_{L3}+ra_{K2}+P_2a_{23}=P_3 \qquad (6)$$

where P_i stands for price of the ith good for $i=1,2,3$; and, a_{23} stands for the per unit requirement of the intermediate good in sector 3. Each of these three equations represents the competitive equilibrium condition in the corresponding product market.

The quantity sub-system of the general equilibrium model is described by the following equations.

$$a_{L1}X_1+a_{L2}X_2+a_{L3}X_3=L \qquad (7)$$

$$a_{K1}X_1+a_{K2}X_2+a_{K3}X_3=K_D+K_F=K \qquad (8)$$

and,

$$a_{23}X_3=X_2 \qquad (9)$$

Equations (7) and (8) are full-employment conditions for labour and capital. Equation (9) represents the demand-supply equality condition in the non-traded intermediate good market. The capital stock of the economy consists of both domestic capital (K_D) and foreign capital (K_F) which are perfect substitutes.[9] Equation (3) is the first-order condition of maximization of the net interest income of the moneylender.

The general equilibrium set-up consists of seven endogenous variables, W, R, r, P_2, X_1, X_2 and X_3, and exactly the same number of independent equations, namely equation (3) and equations (4) – (9). The solution mechanism is the following. W and R are determined from equations (4) and (5) as functions of P_2. Then r, X_1, X_2 and X_3 are determined from equations (3), (6), (7) and (8) simultaneously as functions of P_2. Finally, P_2 is solved from equation (9).

3. Comparative statics

Here we examine the effects of an inflow of foreign capital and/or an emigration of labour on factor prices. The conventional wisdom as obtained from competitive equilibrium analysis suggests that an inflow of foreign capital must lead to an expansion of the formal sector and draw labour from the informal sectors resulting in an increase in the informal sector wage rate. The formal and informal interest rates should go down as the supply of capital rises given its demand. On the other hand, an emigration of labour lowers the availability of labour in the source country and should raise the informal sector wage. The labour-intensive informal sectors are expected to contract for scarcity of labour and release capital to the formal sector leading to an expansion of the latter. The interest rate in the informal sector should go down while the formal interest rate should go up. We are going to show that these results are not so straightforward in this model for two reasons: (i) there is monopoly in the informal credit market; and, (ii) there is a non-traded good (produced by sector 2) in the picture and there is a complementary relationship between the formal sector (sector 3) and the non-traded sector.

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[9] It may be mentioned that this assumption has been widely used in the theoretical literature on trade and development.

Differentiating both sides of equations (4) and (5) and solving them we find

$$\hat{W} = -(\frac{\theta_{K1}}{|\theta|})\hat{P}_2 \tag{10}$$

and,

$$\hat{R} = (\frac{\theta_{L1}}{|\theta|})\hat{P}_2 \tag{11}$$

Here θ_{ji} is the distributive share of the j th factor in the i th sector. We assume that $|\theta| = (\theta_{L1}\theta_{K2} - \theta_{L2}\theta_{K1}) > 0$. This implies that the non-traded intermediate good-producing informal sector (sector 2) is more capital-intensive than the traded good-producing informal sector (sector 1) in both physical and value sense.

Differentiating both sides of equations (3), (6), (7) and (8), simplifying and arranging them in a matrix notation, we have

$$\begin{bmatrix} \theta_{K3} & 0 & 0 & 0 \\ \mathrm{A}_2 & \mathrm{A}_1 & -\mathrm{A}_1 & 0 \\ \lambda_{\mathrm{L3}}\mathrm{S}^3_{LK} & \lambda_{\mathrm{L1}} & \lambda_{\mathrm{L2}} & \lambda_{\mathrm{L3}} \\ -\lambda_{\mathrm{K3}}\mathrm{S}^3_{KL} & \lambda_{\mathrm{K1}} & \lambda_{\mathrm{K2}} & \lambda_{\mathrm{K3}} \end{bmatrix} \begin{bmatrix} \hat{r} \\ \hat{X}_1 \\ \hat{X}_2 \\ \hat{X}_3 \end{bmatrix} = \begin{bmatrix} -\theta_{23}\hat{P}_2 \\ A_3\hat{P}_2 \\ (\hat{L} - A_4\hat{P}_2) \\ (\hat{K} + A_5\hat{P}_2) \end{bmatrix}; \tag{12}$$

where: $A_1 = a_{K1}X_1[(1 - S^1_{KL}) + \frac{r}{R}S^1_{KL}] = -a_{K2}X_2[(1 - S^2_{KL}) + \frac{r}{R}S^2_{KL}]$;

$$A_2 = (\frac{r}{R})(S^1_{KL}a_{K1}X_1 + S^2_{KL}a_{K2}X_2) > 0;$$

$$A_3 = (\frac{1}{|\theta|})[\theta_{K1}\{a_{K1}X_1S^1_{KL} + a_{K2}X_2S^2_{KL} + (R - r)W(\frac{\partial^2 a_{K1}}{\partial R \partial W}X_1 + \frac{\partial^2 a_{K2}}{\partial R \partial W}X_2)\} \tag{13}$$

$$+\theta_{L1}\{2(a_{K1}X_1S^1_{KL} + a_{K2}X_2S^2_{KL}) - (R - r)R(\frac{\partial^2 a_{K1}}{\partial R^2}X_1 + \frac{\partial^2 a_{K2}}{\partial R^2}X_2)\}] > 0;$$

$$A_4 = (\frac{\lambda_{L1}S^1_{LK} + \lambda_{L2}S^2_{LK}}{|\theta|}) > 0;$$

$$A_5 = (\frac{\lambda_{K1}S^1_{KL} + \lambda_{K2}S^2_{KL}}{|\theta|}) > 0;$$

and, λ_{ji} is the allocative share of the j th factor in the i th sector.

Solving the set of equations (12) by Cramer's rule we obtain the following expressions.

$$\hat{r} = -(\frac{\theta_{23}}{\theta_{K3}})\hat{P}_2 ; \tag{14}$$

$$\hat{X}_1 = (\frac{\hat{P}_2}{\Delta})[(\theta_{K3}A_3 + \theta_{23}A_2)(\lambda_{L2}\lambda_{K3} - \lambda_{L3}\lambda_{K2}) + A_1\{\theta_{23}\lambda_{L3}\lambda_{K3}(S_{LK}^3 + S_{KL}^3)$$
$$-\theta_{K3}(\lambda_{K3}A_4 + \lambda_{L3}A_5)\}] - (\frac{\theta_{K3}A_1\lambda_{L3}}{\Delta})\hat{K} + (\frac{\theta_{K3}A_1\lambda_{K3}}{\Delta})\hat{L}; \tag{15}$$

$$\hat{X}_2 = -(\frac{\hat{P}_2}{\Delta})[\theta_{K3}A_1(A_4\lambda_{K3} + A_5\lambda_{L3}) + \theta_{K3}A_3(\lambda_{L1}\lambda_{K3} - \lambda_{L3}\lambda_{K1})$$
$$+\theta_{23}\{A_2(\lambda_{L1}\lambda_{K3} - \lambda_{L3}\lambda_{K1}) - A_1\lambda_{L3}\lambda_{K3}(S_{LK}^3 + S_{KL}^3)\}] \tag{16}$$
$$+(\frac{\theta_{K3}\lambda_{K3}A_1}{\Delta})\hat{L} - (\frac{\theta_{K3}\lambda_{L3}A_1}{\Delta})\hat{K} ;$$

and,

$$\hat{X}_3 = (\frac{\hat{P}_2}{\Delta})[\theta_{K3}\{A_5(\lambda_{L1} + \lambda_{L2}) + A_4(\lambda_{K1} + \lambda_{K2})\} + \theta_{K3}A_3(\lambda_{L1}\lambda_{K2} - \lambda_{L2}\lambda_{K1})$$
$$+\theta_{23}\{A_2(\lambda_{L1}\lambda_{K2} - \lambda_{L2}\lambda_{K1}) - A_1\lambda_{L3}(\lambda_{K1} + \lambda_{K2})S_{LK}^3 - A_1\lambda_{K3}(\lambda_{L1} + \lambda_{L2})S_{KL}^3\}]$$
$$+(\frac{\theta_{K3}A_1}{\Delta})(\lambda_{L1} + \lambda_{L2})\hat{K} - (\frac{\theta_{K3}A_1}{\Delta})(\lambda_{K1} + \lambda_{K2})\hat{L} \tag{17}$$

Here Δ is the determinant of the above coefficient matrix. It is given by

$$\Delta = \theta_{K3}A_1[\underset{(+)}{(\lambda_{L2}\lambda_{K3} - \lambda_{L3}\lambda_{K2})} + \underset{(+)}{(\lambda_{L1}\lambda_{K3} - \lambda_{L3}\lambda_{K1})}] \tag{18}$$

Note that sector 3 is more capital-intensive relative to both sector 1 and sector 2 in physical sense as well as in value sense.

As sector 2 produces a non-traded intermediate good its market must clear domestically. For the equilibrium in the intermediate good market to be Walrasian stable it requires that

$$D = (\frac{\hat{X}_3}{\hat{P}_2}) - (\frac{\hat{X}_2}{\hat{P}_2}) < 0$$

Using equations (16) and (17) and simplifying the stability condition we have

$$D = (\frac{1}{\Delta})[\theta_{K3}A_1(A_4 + A_5) + (\theta_{K3}A_3 + \theta_{23}A_2)\{\lambda_{L1}(\lambda_{K2} + \lambda_{K3}) - \lambda_{K1}(\lambda_{L2} + \lambda_{L3})\}$$

$$-\theta_{23}A_1(\lambda_{L3}S_{LK}^3 + \lambda_{K3}S_{KL}^3)] < 0 \quad (19)$$

In equilibrium the demand for the non-traded intermediate good must equal its supply. Totally differentiating both sides of equation (9) one obtains

$$\hat{X}_3 = \hat{X}_2 . \quad (20)$$

From equation (20) use of equations (16) and (17) and simplification yield

$$\hat{P}_2 = -(\frac{\theta_{K3}A_1}{\Delta D})\hat{K} \text{ when } \hat{L} = 0 ; \quad (21)$$

and,

$$\hat{P}_2 = (\frac{\theta_{K3}A_1}{\Delta D})\hat{L} \text{ when } \hat{K} = 0 \quad (22)$$

Substituting the expression for Δ from equation (18) in equations (21) and (22), we find the following expressions.

$$(\frac{\hat{P}_2}{\hat{K}}) = -[\frac{1}{D[(\lambda_{L2}\lambda_{K3} - \lambda_{L3}\lambda_{K2}) + (\lambda_{L1}\lambda_{K3} - \lambda_{L3}\lambda_{K1})]}] > 0 ; \quad (23)$$

(-) (+) (+)

and,

$$(\frac{\hat{P}_2}{\hat{L}}) = [\frac{1}{D[(\lambda_{L2}\lambda_{K3} - \lambda_{L3}\lambda_{K2}) + (\lambda_{L1}\lambda_{K3} - \lambda_{L3}\lambda_{K1})]}] < 0 \quad (24)$$

(-) (+) (+)

Equations (23) and (24) help us to establish the following proposition.

Proposition 1: An increase in the capital endowment, given the labour endowment, unambiguously raises the price of the non-traded intermediate good. An increase in the labour endowment of the economy, given the capital endowment lowers it.

Here an inflow of foreign capital leads to an expansion of the capital stock while an emigration of labour from the source country lowers its labour endowment. The intuitive explanations of proposition 1 are fairly straightforward. The production structure here is an indecomposable one. Therefore factor prices depend on both commodity prices and factor endowments. Sector 1 and sector 2 together form a Heckscher-Ohlin subsystem (HOSS) as they use the same two inputs. Besides, there is a perfect complementarity between sector 2 and sector 3 as the latter uses the output of the former as an input in a fixed proportion. A mere inspection of equations (15) – (17) reveals that any changes in factor endowments affect the output composition through a Rybczynski effect and through a change in the price of the non-traded input, P_2. The latter produces a Stolper-Samuelson effect and a subsequent Rybczynski type effect in the HOSS which in turn produces an indirect impact on the output composition of the different sectors. An increase in capital endowment leads to an expansion of the most capital-intensive sector (sector 3) and contraction of both the informal sectors. In equations (15) – (17), these changes are captured by the terms containing $\hat{K}$. As sector 3 expands, the demand for the non-traded intermediate good produced by sector 2 rises while its supply falls. This unambiguously raises the price of the non-traded good, P_2. On the contrary, if the labour endowment rises (falls) sector 3, being the least labour-intensive sector, contracts (expands) while the two informal sectors expand (contract). The demand for the non-traded input goes down (up) while its supply goes up (down). Consequently, P_2 falls (rises) unequivocally.

Using equations (10), (11) (14), (23) and (24) we obtain effects of changes in K and L on factor prices. These effects are described as follows.

$$(\frac{\hat{W}}{\hat{K}}) = -\underset{(+)}{(\frac{\theta_{K1}}{|\theta|})}\underset{(+)}{(\frac{\hat{P}_2}{\hat{K}})} < 0 ; \qquad (25)$$

$$(\frac{\hat{R}}{\hat{K}}) = \underset{(+)}{(\frac{\theta_{L1}}{|\theta|})}\underset{(+)}{(\frac{\hat{P}_2}{\hat{K}})} > 0 ; \qquad (26)$$

$$(\frac{\hat{r}}{\hat{K}}) = -(\frac{\theta_{23}}{\theta_{K3}})(\frac{\hat{P}_2}{\hat{K}}) < 0 \qquad (27)$$

(+)

$$(\frac{\hat{W}}{\hat{L}}) = -(\frac{\theta_{K1}}{|\theta|})(\frac{\hat{P}_2}{\hat{L}}) > 0 \qquad (28)$$

(+) (-)

$$(\frac{\hat{R}}{\hat{L}}) = (\frac{\theta_{L1}}{|\theta|})(\frac{\hat{P}_2}{\hat{L}}) < 0 \qquad (29)$$

(+) (-)

and,

$$(\frac{\hat{r}}{\hat{L}}) = -(\frac{\theta_{23}}{\theta_{K3}})(\frac{\hat{P}_2}{\hat{L}}) > 0 \qquad (30)$$

(-)

All these results can be summarized in terms of the following proposition.

Proposition 2: An increase (a decrease) in the endowment of capital (labour) given the endowment of the other factor, leads to (i) an increase in the informal interest rate; (ii) a decrease in the formal interest rate; and, (ii) a fall in the informal wage rate.

Proposition 2 can be intuitively explained as follows. While explaining proposition 1 we have already shown how an increase in the capital endowment raises the price of the non-traded input, P_2. This produces a Stolper-Samuelson effect in the HOSS raising the informal interest rate (R) and lowering the informal sector wage (W) as the manufacturing informal sector (sector 2) is assumed to be more capital-intensive than the agricultural informal sector (sector 1). The formal interest rate, r, must fall so as to satisfy the zero-profit condition in sector 3.[10] The increase in capital endowment, given its demand, exerts a downward pressure on the formal interest rate in this sector. The effects of a change in the labour endowment on factor prices can easily be explained following the reverse mechanism.

[10] See equation (6).

4. Concluding remarks

In this paper we have developed a three-sector static general equilibrium model of a small open economy with distortions in both the labour market and the capital market. The informal capital market is different from the formal capital market in the sense that the latter being competitive in nature supplies capital to the formal sector firms while the former being monopolistic in nature provides funds to the informal and rural sector producers. We, however, do not consider the Harris-Todaro (1970) type rural-urban migration and unemployment of labour.

We obtain a few interesting results. If the informal sector producing a non-traded intermediate good for the formal sector is more capital-intensive than the rural informal sector, an increase in the capital stock and/or a decrease in labour endowment would lower the wage rate in the informal labour market as well as the interest rate in the formal credit market but raises the interest rate in the informal capital market. Thus degrees of distortion in both the factor market aggravate in this case. This result is different from that we obtain in Gupta (1997) model where an increase in the capital stock and/or a decrease in labour endowment raises the informal wage rate and lowers the interest rate in the informal credit market when there is Harris-Todaro (1970) type induced migration and the labour sending rural sector is more capital-intensive than the labour receiving urban informal sector. No unambiguous results on factor prices in the informal sector can be obtained in Gupta (1997) when the urban informal sector is more capital-intensive than the rural sector. Moreover, there is a major difference in the mechanism of working between the two models. In Gupta (1997), changes in factor endowments affect factor prices through the Harris-Todaro migration equilibrium condition, but in the present model, corresponding effects are generated through movement in the price of the non-traded good.

Finally, there are some restrictive assumptions embodied in the present analysis. There is no induced migration and unemployment which are two salient features of an LDC. Also the labour input is homogeneous and there is no distinction between workers with respect to their skills. Also some of the essential characteristics of the informal credit market like interlinkages with other markets are missing. Besides, the informal credit market is fragmented oligopolistic in nature and there is a segment in the credit market where informal lenders compete with each other[11]. Future research in this area should address these issues.

[11] See Basu and Bell (1991), Mishra (1994) and Basu (1997) in this context.

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