Traded Goods, Tax and Intermediation - the Role of Corrupt Nontraded Sector

Mandal, Biswajit

Department of Economics University at Albany-SUNY Albany, NY, USA and Visva-Bharati University, Santiniketan India

2014

Traded Goods, Tax and Intermediation - the Role of Corrupt Nontraded Sector

Biswajit Mandal

Department of Economics
University at Albany-SUNY
Albany, NY, USA
and
Visva-Bharati University, Santiniketan
India

Corresponding author:

BISWAJIT MANDAL
Department of Economics & Politics
Visva-Bharati University
Santiniketan, India
731235
Telephone: (+91) 03463262751-56 Extn. 405
E-mail: biswajiteco@gmail.com / bmandal@albany.edu

Traded Goods, Tax and Intermediation - the Role of Corrupt Nontraded Sector

Abstract

This paper uses a Heckscher-Ohlin nugget framework with both traded and non-traded goods. Our motive is to investigate the effects of corruption and tax cut. We assume only the non-traded sector to be corruption affected. We argue that a fall in the degree of corruption surprisingly increases number of intermediators while tax change has no effect on it. But the size of the intermediation activities expands in both the cases. Low corruption diminishes the exportable production and raises importable production while a tax cut does not have any effect. The welfare implication is ambiguous in case of a decrease in cost of corruption. A tax cut, however, raises the welfare unambiguously.

Key words: International Trade, Corruption, General Equilibrium, Welfare.

JEL classification: F1, D73, D5, D6

1. Introduction

One important structure of general equilibrium trade model that came up in the recent past as an attractive and more real world like scenario is the Heckscher-Ohlin (H-O) nugget (Jones and Marjit, 1992). A few years after the issue had been raised in Gruen and Corden (1970), the idea of complementary structure caught the attention of many trade and development researchers and resulted in a number of papers. Brecher and Alejandro (1977), Jones and Marjit (1992, 2009), Marjit (2003, 2005, 2008), Kar and Marjit (2001), Beladi and Chao (1993), Beladi and Yabuuchi (2001) deserve to be mentioned. The standard Heckscher-Ohlin-Samuelson (hereafter HOS) model is too restrictive to analyze the "complementarity" nature of production which is commonly observed in reality where we experience co-existence of both traded and non-traded sectors. H-O nugget is an apt one in such condition. Therefore, complementarity concept can easily be brought into the standard general equilibrium framework comprising of traded and non-traded sectors to explain the effects on return to factors, formal – informal wage, employment, welfare etc.

Conventionally, in trade and development literature, complementarity structure is used to analyze how changes in tariff, subsidy, and factor mobility impact the economy in general. In existing papers the course of action generally runs through price equations and consequent changes in quantities. In this essay, however, we wish to propose a set up where both price and endowment effects act simultaneously by virtue of the structure of the model. Accordingly we assume that the economy comprises of two traded goods and one non-traded good. Traded goods use same mobile factors of

production while the non-traded good requires one specific factor and shares a mobile factor with traded goods. Traded goods are subject to tax which is collected from producers and in turn it impacts the return to factors used in such goods. Non-traded good, on the other hand, need not to pay tax and hence do not qualify for being internationally traded. From consumers' perspective since it is very difficult to verify the quality of the product, they sometime look for some sort of labelling on the product that guarantees a minimum quality. This assurance is given by the government, and for that the commodities have to be registered with the state offices. Such kind of certification or legality is assigned to those goods only that pay tax. Since non-traded good does not pay requisite tax, they are not allowed the required certification and subsequently tagged as 'illegal', *per se*. Producers of such goods don't mind being labeled as illegal goods' producers as they are aware of huge domestic market and tax avoidance may result in an increase in factor prices. Because of 'illegal' nature government always want non-traded sector to be removed from the society. In order to negate such governmental initiatives, illegal producers take resort of intermediation with administrators, be it institutional or political. This is done by some labors who actually act as intermediaries between producers and institution. Therefore non-traded sector is beset with corruption related intermediation cost. It is also implicitly assumed that payment for tax must be greater than payment for intermediation. Otherwise there is no point for tax evasion by producing a non-traded good. Therefore any change in the tax rate or degree of corruption would impinge on factors' return and labor employment in intermediation activity.

In this model, in conjunction with pseudo price effect caused by a change in the degree of corruption or tax cut, the possibility of endowment effect is also explored. Note that we are not talking about that kind of Rybczynski effect which stems from a change in factor return (making the constraint less or more binding), and is often discussed in papers that deal with the issues of protectionism, capital mobility etc. In our model we have, in fact, two types of Rybczynski effects. One originates from change in the factors' return, the conventional way to look at the complementarity structure. The other one comes from the direct change in the labor endowment for productive purpose. It essentially enters through the change in degree of corruption activities that require only labor which also has an alternative employment option in production of goods.

The structure of the paper is clustered in the following fashion. Section 2 deals with the model and impact of change in the degree of corruption and change in tax rate. The last section concludes the paper.

2.1 The Model and Analysis

There are two tradeable goods X and Y produced in a small open economy in the neo-classical framework using labor (L) and capital (K). Say K represents credit from formal credit market. Both X and Y are taxed at an identical rate, τ. Since P_X and P_Y are determined in the world market, it does not matter whether the tax is specific or

advalorem[1]. Tax collected per unit of X and Y is fixed, and this will vanish in comparative static analysis if we ignore any change in τ itself. In case of tax cut, the entire analysis would be driven by τ only. L and K are perfectly mobile across X and Y. We also presume that X is a labor-intensive exportable commodity while Y is a capital-intensive importable one. However, there is another good, M. M does not pay tax. Non-payment of tax indicates that it is non-authenticated by the government. This deters M to be traded internationally. So M is non-tradeable and it requires labor (L) and informal credit (T). For that M is not legal, producers do not have access to formal capital or credit market, they rush to the informal money lenders for credit. Rate of interest in the informal credit market is not identical with that of in the formal credit market. However, this sector provides employment, at least, to some labor. Particularly in developing economies drowned with enormous labor supply this phenomenon is prevalent.

Nonetheless, to sustain, producers of M need to comply with stringent institutional regulations. Institution or government want sectors like M to be evicted as

[1] The tax we are talking about is commodity tax. Implications for commodity tax and trade tax are distinctly different. In a small open economy price of traded goods are pre-fixed at the level equal to the international market. So consumers are not willing to pay anything more than international price if goods are traded freely. Therefore any commodity tax has to be borne by producers only. Otherwise buyers will move to the international market where goods are available at a relatively low price. Therefore, a commodity tax induces reduction in factor prices as tax itself constitutes a part of production cost and the commodity price is given. On the other hand in case of trade tax consumers have to pay a price equal to the commodity price plus trade tax (say tariff) for internationally traded goods. Domestic producers take this advantage and charge a price for domestically produces good equal to the tariff inclusive price of traded good. Consumers bear the burden of trade taxes and factor prices go up. Hence implications of a reduction in commodity tax and trade tax on factor prices are markedly opposite. So an interesting indication of the present set up is that it can be extended for a comparative study between commodity tax and trade tax and their effects on non-traded sector, intermediation, informality etc.

they do not pay tax and are illegal by nature. To combat such obstacles producers employ intermediaries who actually watch out for these institutional rules. Intermediaries are unproductive in that no additional output is produced by them. Their marginal productivities in terms of the volume of goods are zero though they get economic return for their work. However, without such an arrangement production of M could not have taken place. And we may further assume that from the sustainability perspective production of M is a must.[2] Since M is a non-traded one, the price has to be determined domestically. Note that in our small open economy set up we assume one out of two traded goods as numeraire. So the relative price of the other traded good is fixed in terms of the numeraire. In what follows we treat P_M relative to the numeraire as an endogenous variable and determine the value from the model itself.

Intermediation is done only by labor. People engaged in intermediation activities get pecuniary benefit without producing goods. Let Z be the sector representing intermediations. And α is the fraction of value of M that is lost due to political/institutional complications related intermediations[3]. Thus we coin this sort of

[2] It may also be considered that M is either agricultural food production or the food stalls beside different offices. These temporary food stalls supply essential input (food) to those working in the formal / fair segment of the economy. For the time being let us keep ourselves mum whether price of M would be higher or not and if yes, why. However, price of M could well be lower than the identical good produced, if at all, in the formal sector. Because informal sector does not require set up costs, proper permission, to pay tax, to spend a hefty amount as advertisement cost etc.

[3] By the word 'lost' we mean loss from production. This 'lost' value is, however, very much within the economy as some labors are paid by the 'lost' value. Therefore, in a sense this is not 'lost' from the economy, and hence comes back to the analysis when one talks about consumption, welfare etc.

intermediations as directly unproductive profit-seeking activities[4] (Bhagwati, 1982). This is the concept of corruption that we are going to use in our model. In earlier papers Mandal and Marjit (2010, 2012, and 2013) used the same notion of corruption in explaining various trade and development concerns.

We have competitive markets for production as well as for corruption related intermediation. Competitive corruption market implies that the lost output due to corruption is fully exhausted in paying out intermediaries. Moreover, we have the standard neo-classical assumptions of constant returns to scale (CRS) and diminishing return to factors. Here it is worth mentioning that unlike some other papers in the literature we do not introduce unionized wage rate in one sector and competitive wage in other one. This is the approach extensively used in a book on informal sector by Marjit and Kar (2011). This paper deviates from such notion of introducing some sort of informality or illegality. Here we introduce the idea of non-payment of tax to define a sector which banks on intermediaries. Non-payment of tax categorizes this sector as an illegal one, per se, and this is what calls for payment to intermediaries for sustenance.

The following set of equations describes the model and the interpretations of symbols are usual and well used in trade models (Jones, 1965, 1971). The competitive price conditions are given by[5]:

[4] In a crude sense intermediation is not *unproductive* as intermediation adds value to M as an input. What we want to men, however, is that without intermediation same amount of M could have been produced had there been institutional permission. So in this sense intermediation is *unproductive*.

[5] To build the system of equations, we use the following notations: P_i = Price of ith good, $i = X, Y, M$; w = Return to labor, L; r = Return to capital, K; R = Return to T; a_{ij}= Technological co-efficient; θ_{ij} = value

$$w\,a_{LX} + r\,a_{KX} = P_X(1-\tau) \quad (1)$$

$$w\,a_{LY} + r\,a_{KY} = P_Y(1-\tau) \quad (2)$$

$$w\,a_{LM} + R\,a_{TM} = P_M(1-\alpha) \quad (3)^{6}$$

We also assume that for intermediation purpose one labor is required per unit production of M. Therefore,

$$\alpha P_M = w \quad (4)$$

Total value of output generated for intermediation purpose is $\alpha P_M M$. In a competitive set up this has to be exactly spent out on the people engaged in such activities. So,

$$\alpha P_M M = w\,L_Z \quad (5)$$

Implications of full employment conditions are:

$$a_{LX}X + a_{LY}Y + a_{LM}M = \bar{L} - L_Z \quad (6)$$

$$a_{KX}X + a_{KY}Y = \bar{K} \quad (7)$$

$$a_{TM}.M = \bar{T} \quad (8)$$

Thus the structure we have, in the end, is a recursive one because T is used only in M; K is used in both X and Y; and X Y and M all use L as factors of production. Our framework bears the complementarity nature of specific factor (henceforth SF) and HOS type structures. Jones and Marjit (1992) and Marjit (2003) are two classic examples of amalgamation of HOS and SF structures where HOS subsystem distinctly determines

---

share of ith factor in jth commodity; λ_{ij} = employment share of i in j production; $\overline{K}$ = Total supply of K; $\overline{L}$ = Total supply of labor; $\overline{T}$ = Total supply of T; L_Z = Labor engaged in intermediation activities; τ= amount of tax on X and Y; a *hat* over a variable represents proportional change.

[6] Alternatively equation (3) can be expressed as $w\,a_{LM} + R\,a_{TM} + w\alpha = P_M$ where intermediation is done by labor only like our model. Instead of this we prefer to go with $w\,a_{LM} + R\,a_{TM} = P_M(1-\alpha)$. This keeps the possibility open where other factors like K and T can also be brought into the intermediation activities as it is done in Marjit and Mandal (2012). Here we assumed only labor to be used in intermediation just to bypass factor intensity comparison among sectors which is done in several other papers including Marjit and Mandal (2013) though there was no non-traded good, per se. In the alternative set up a change in α essentially displays a kind of technological progress or regress in intermediation. An important reference in this connection is Findlay and Jones (2000).

the two mobile factors' returns and the remaining factor's return in the SF subsystem solely depends on the other commodity's price. However, if we index something else to price (α in our model), that will also influence the return to the remaining factor. In our model w and r get determined from the HOS framework and R is derived as residual. Note that, $\alpha \in [0,1]$; a low α will mean lower degree of intermediation or corruption and conversely.

Since the country is small in nature, P_X and P_Y are determined from the world market. For any given τ we can solve for w and r from equation (1) and (2). Then for any value of α, we have P_M from (4). So R can be calculated from (3). Thus all a_{ij}s are determined through CRS assumption. (8) gives M, consequently L_Z gets solved from (5). And eventually (6) and (7) help in solving X and Y. So the system is entirely solved for fixed endowments of L, K and T.

2.2 Change in the degree of corruption

Let us suppose that owing to some reasons α falls. It could be because of administrative actions or civil society movement or local governance etc. Therefore (1-α) increases in the RHS of equation (3). Since the framework is of H-O nugget type and T is specific in M, any change in α will be directly appropriated by R. Hence R will rise for any given P_M. But interestingly P_M is also endogenous in this structure. Note that there will be no change w and r since these are already determined from equation (1) and (2). So R becomes a function of both P_M and α. Change in R is defined as

$$\hat{R} = \frac{1}{\theta_{TM}}\{\hat{P}_M(1-\alpha) - \hat{\alpha}\alpha\} \quad (9)$$

When α falls in M, effective price of non-traded good goes up. This drives higher production of M, and leads to an increase in demand for both L and T. So, w and R have a tendency to go up. But w is fixed from (1) and (2). Hence the increase in $P_M\,(1-\alpha)$ due to a fall in α directly jacks up R.

Again specification of equation (4) provides with a simple relation between P_M and α. As w is non-changing here, the relation becomes

$$\hat{P}_M = (-)\hat{\alpha} \quad (10)$$

Change in R is further strengthened as P_M also rises following a decrease in α. Plugging (10) into (9)

$$\hat{R} = \frac{(-)\hat{\alpha}}{\theta_{TM}} > 0 \quad \text{(since } \hat{\alpha} < 0) \quad (11)$$

Using the concept of elasticity of substitution one can easily arrive at the precise expression for change in non-traded output. This is

$$\widehat{M} = (-)\hat{\alpha}\frac{\theta_{LM}}{\theta_{TM}}\sigma_M. \quad (12)\ ^{7}$$

As α falls $\widehat{M}$ >0. Due to a fall in the degree of corruption return to T goes up as it is the specific factor. Producers economize on its usage by substituting L for T as T is dearer now. Per unit requirement of T in M goes down. This drives an increase in M for given amount of T. Producers, essentially, find the production of M more lucrative compared to X and Y as the cost of intermediation has fallen.

[7] σ_M is the elasticity of substitution between L and T in M. $\sigma_M = \frac{\hat{a}_{TM} - \hat{a}_{LM}}{\hat{w} - \hat{R}}$. Application of Envelope theorem and zero profit condition ensure that $\hat{a}_{TM} = \sigma_M \frac{\theta_{LM}}{\theta_{TM}}\hat{\alpha}$.

Equation (5) and the arguments explained above guarantee an increase in L_Z as well. Expansion of M secures it as per unit of M requires only one unit of intermediators. It is also apparent from (5) as

$$\hat{L}_Z = \hat{M} = (-)\hat{\alpha}\frac{\theta_{LM}}{\theta_{TM}}\sigma_M \tag{13}$$

Proposition I: A fall in the degree of corruption increases both non-traded production and number of unproductive intermediators in the economy. ■

Also note that the size of intermediation sector must expand following a reduction in α. The size is shown by $\alpha P_M M = w\, L_Z$. Though w does not change, L_Z increases unambiguously. This indicates an unequivocal expansion of intermediation sector denoted by $w\, L_Z$.

Consequently some labor come out of traded sector and changes the sectoral composition. This is a kind of Rybczynski effect that takes place in HO subsection of the model experienceing shrinkage in labor endowment. Consequently, production of labor-intensive X falls and that of capital-intensive Y inflates. Mathematically,

$$\left.\begin{aligned}\hat{X} &= \frac{1}{|\lambda|}\hat{\alpha}\,\sigma_M\frac{\theta_{LM}}{\theta_{TM}}(\lambda_{LZ}+\lambda_{LM})\lambda_{KY} < 0\\ \hat{Y} &= (-)\frac{1}{|\lambda|}\hat{\alpha}\,\sigma_M\frac{\theta_{LM}}{\theta_{TM}}(\lambda_{LZ}+\lambda_{LM})\lambda_{KX} > 0\end{aligned}\right\} \tag{14}$$[8]

[8] $|\lambda| = \begin{vmatrix}\lambda_{LX} & \lambda_{LY}\\ \lambda_{KX} & \lambda_{KY}\end{vmatrix}$. $|\lambda|$is positive when X is labor intensive and is negative when Y is labor intensive.

2.3 Change in the tax rate

Initiation of any change in the tax rate τ implies an alteration in the effective cost of production of those goods that are beset with tax. Here only traded goods are those commodities. Given the small economy nature and hence fixed international prices for both X and Y, the change in effective cost of production due to change in τ will be identically offset by opposite changes in the factor prices. Since both X and Y are symmetrically affected by τ, and they share same mobile factors L and K, return to both these factors will increase following a tax cut.

$\widehat{w} = (-)\hat{\tau}\tau > 0$; $\hat{r} = (-)\hat{\tau}\tau > 0$ [9]

So tax cut benefits both L and K. When per unit tax goes down, producers intend to produce more. This raises the demand for factors and hence pulls up both w and r. Because of HOS structure w and r will increase by same proportion leaving no room for factor substitution. Therefore, this should not trigger any output change. In our set up, however, we may not have non-changing output combination of X and Y as w may eventually induce some changes in R and hence on L_Z. We will discuss this phenomenon in the subsequent analysis.

Equation (4) yields, $\hat{P}_M = (-)\hat{\tau}\tau > 0$. Using this we get

$\hat{R} = (-)\hat{\tau}\tau > 0$ (since $(\theta_{LM} + \theta_{TM}) = 1 - \alpha$ and $\hat{\tau} < 0$) (15)

Higher return to L in traded sector attracts labor from both non-traded and intermediation activities. The moment some L moves out of M, T becomes excess in

[9] $|\theta| = \begin{vmatrix} \theta_{LX} & \theta_{KX} \\ \theta_{LY} & \theta_{KY} \end{vmatrix}$. $|\theta|$is positive when X is labor intensive and is negative when Y is labor intensive

supply. This pushes R down. On the other hand an increase in P_M has a tendency to pull it up. Subsequently R rises by the same proportion as P_M and w. Total increase in P_M has to be shared between w and R. But w appropriates only a fraction, θ_{LM}, of the proportional change. Hence R will also increase by the same proportion and adjusts with the residual weights of the value share.

Since w and R increase at the same rate, the possibility of substitution between L and T is completely ruled out. Producers will continue to produce the same amount of M as they were producing before. This is shown as

$$\hat{M} = \sigma_M \theta_{LM} (\hat{\tau}\tau - \hat{\tau}\tau) = 0 \qquad (16)$$

As we have already discussed in the previous section, the change in L_Z would be exactly equal to that of M. Therefore L_Z also remains unchanged. The idea is that, lessening of tax reduces the degree of instigation to switch to the nontraded sector. This results in less production of M and less requirement of intermediators. However, similar benefit is also seen in nontraded sector through an increase in P_M. This has been trickled down through changes in the return to the mobile factor. Therefore producers are indifferent among traded and nontraded goods.

Proposition II: A tax cut will have no effect on nontraded activities and number of intermediators in the economy. ■

The effect on the size of the intermediation sector is also unequivocal like the 'corruption-case'. This depends on the reactive strength of w and L_Z . Therefore, total size, in effect depends on the value of output produced in the nontraded sector. Thus we propose that

Proposition III: Following a tax cut the size of the intermediation sector will expand.

Proof: Total size = $\alpha P_M M = w L_Z$. Change in the size is the product of change in w and L_Z together, i.e $\hat{w} + \hat{L}_Z = \hat{\alpha} + \hat{P}_M + \hat{M} = (-)\hat{\tau}\tau$. Here $\hat{\tau} < 0$. Thus the total value is positive.

Now let us go back to the traded sector. As L_Z is unchanged, effective labor supply in the traded sector will also remain same. Therefore, there would be no change in X and Y. This argument needs no further qualification as it is quite apparent in a HOS structure.

2.4 Welfare implication

The welfare implication of the issues discussed in the preceding section is really interesting in that the possibility of change in welfare may come up even without changing the volume of production. Taking clue from the basic model let us reiterate that when a traded commodity is taxed neither the consumers are directly affected nor the producers themselves take care of the tax amount. Producers immediately pass on the tax burden to the owners of factors of production. Only factors' return fall due to commodity tax in our set up. So the disposable income of the consumers who also own factors, changes. Therefore, in presence of distortion, be it tax or intermediation, total factor income may fall short of total value of production implying imbalance between production and consumption where balance, *per se*, indicates an undistorted set up which we do not have here. Again, since we have not presumed any mechanism for redistributing the tax revenue, this part of total economic pie is simply siphoned out of

the system and never flows back either in form of consumption expenditure or factor income. This may constitute a '*hidden*' part of the total value produced but not consumed. On the other hand in case of intermediation, payment to intermediators is very much within the economy and constitutes a part of total consumption though they cut back the volume of production and hence total consumable output. Perhaps this is why and how welfare implication of the current essay becomes more revealing.

Though the welfare implication of our model is relatively simple to follow, the eventual outcome is not identical in these cases. Following standard calculation one can arrive at the following expression for welfare. Note that terms of trade effect is ruled out by small country assumption. If Ω stands for welfare, change in welfare can be expressed as:

$$d\Omega = dX.P_X + dY.P_Y + dM.P_M + dP_M.M$$

Using the budget constraint and setting the prices of the traded goods as constants, without losing generality we get the change in welfare as follows:

$$d\Omega = dw.\bar{L} + dr.\bar{K} + dR.\bar{T} + d\tau\,(X + Y) + \tau\,(dX + dY)$$

When α decreases the expression is reduced to $\Omega = dR.\bar{T} + \tau\,(dX + dY)$. $dR.\bar{T} > 0$ captures the increased factor income due to low corruption, and $\tau\,(dX + dY)$ represents change in tax revenue due to change in the volume of production of traded goods. $\tau dX < 0$ and $\tau dY > 0$. However, the production of traded goods together must shrink as we move to a lower production possibility frontier owing to the fact that productive labor supply falls. One can check this substituting the relevant variables from sub-section 2.2. Therefore the subsequent effect is ambiguous. However,

interestingly a fall in the degree of corruption pulls out some productive labor and raises *unproductive* employment which is not desired for the society as it pushes down economy's production frontier in general.

In case of tax cut, the welfare equation remains same as $d\Omega = dw.\bar{L} + dr.\bar{K} + dR.\bar{T} + d\tau\ (X + Y) + \tau\ (dX + dY)$. Manipulating this equation marginally and plugging the values of variables following sub-section 2.3 we have $d\Omega = (-)\hat{\tau}\tau\ (w\bar{L} + r\bar{K} + R\bar{T} - X - Y)$. It is obvious from the right hand side of the equation that $(w\bar{L} + r\bar{K} + R\bar{T} - X - Y) > 0$ as there is no entry of M, tax revenue, and price variables. So, $d\Omega > 0$ as $(\hat{\tau} < 0)$. To put things differently let us look at $d\Omega = dX.P_X + dY.P_Y + dM.P_M + dP_M.M$. Analysis of 2.3 confirms that $dX = dY = dM = 0$, $dP_M > 0$, and hence $d\Omega > 0$. The underlying intuition is somewhat like this: when tax is reduced symmetrically in both the traded sectors, factor prices also increase symmetrically leaving no scope for factor substitution. Production of X and Y do not change. Factor specific to M also gains since by virtue of the structure P_M also increases by the same extent as w and r. This ensures that M would not change. Though volume of production does not change, the value of production changes because of an increase in P_M only. Alternatively, when tax is reduced, all factors gain simultaneously and identically. This entails that siphoned out money is less in quantity compared to the case when tax was higher. Therefore, the '*hidden*' part of the economy got shrunk and allowed the consumers to consume more. However, in order to consume more they need not to produce an extra amount like traditional literature. Production was already there, but a part of that was not appropriated by consumers because of paucity of income caused by relatively higher

tax rate. Now, a tax cut allows them to consume a bit more out of the '*hidden*' or '*inventory*' part, per se. Possibly this would not have been the case had there been any mechanism to bring back the tax revenue into the system. And the welfare would have been independent of change in tax and/or tax revenue causing lower factor prices. Hence in our case welfare rises unambiguously due to tax cut.

3. Conclusion

In this paper we have developed an extension of standard HOS framework where we also have SF model as its part. Both traded and non-traded goods are included in such extension which is popularly known as HO nugget. Traded goods are produced following HOS structure in the so-called *fair segment* of the economy where goods are subject to tax. On the other hand non-traded good follows SF set up and is affected by corruption as it does not pay tax. However, non-traded sector is not an unwarranted activity, at least, from the viewpoint of employment of some labors and a specific type pf capital. Under these circumstances a fall in the degree of corruption related cost increases the number of intermediators, raises non-traded good production, contracts the exportable production, and expands the production of import-competing good. Whereas a tax cut does not have any effect either on the number of intermediaries or the production of goods, be it traded or non-traded. But the size of intermediation activity and the price of non-traded good, interestingly, go up in both the cases. Lastly, though lowering the degree of corruption related lost value is unable to provide with

any unambiguous implication for welfare, a tax cut unequivocally raises it for the society.

References

Beladi, H. and C. Chao (1993) – Non-traded goods, urban unemployment and welfare in LDCs. *European Journal of Political Economy*, 9(2), pp 281-292.

Beladi, H. and S. Yabuuchi (2001) – Traiff induced capital inflow and welfare in the presence of unemployment and informal sector., *Japan and the World Economy*, 13(1), pp 51-60.

Brecher, R. and C. D. Alejandro (1977) – Traiff, foreign capital and immiserising growth. *Journal of International Economics*, 7(4), pp 317-322.

Bhagwati, J. (1982) - Directly Unproductive Profit Seeking (DUP) Activities. *Journal of Political Economy*, 90(5), pp 988-1002.

Ethier, W. (1984) – *Higher dimensional issues in trade theory*. In R. W. Jones and P. B. Kenen (Eds) Handbook of International Economics, Vol. 1, Amsterdam,: North-Holland.

Findlay, R. and R. W. Jones (2000) – Factor bias and technical progress. *Economics Letters*, 68(3), pp 303-308.

Gruen, F. and M. Corden (1970) – *A tariff that worsens terms of trade*. In I. A. McDougall and R. H. Snapes (Eds) Studies in International Economics, Amsterdam,: North-Holland.

Jones, R.W. (1965) – The Structure of Simple General Equilibrium Models. *Journal of Political Economy*, 73, pp.557-572.

Jones, R.W. (1971) – *A three-factor model in theory, trade and history*. In Bhagwati, J et al (Eds) Trade, Balance of Payments and Growth, North- Holland, Amsterdam, pp. 3-21.

Jones, R.W. and S. Marjit (1992) – *International trade and endogenous production structure*. In Neuefeind, W et al (Eds) Economic Theory and International Trade: Essays in honour of J. Trout Rader, Sringer Verlag.

Jones, R.W. and S. Marjit (2009) – Competitive trade models and real world features. *Economic Theory*, 41(1), pp. 163-174.

Kar, S. and S. Marjit (2001) – Informal sector in general equilibrium: welfare effects of trade policy reforms, *International Review of Economics and Finance*, 10(3), pp 289-300.

Mandal, B. and S. Marjit (2010), Corruption and Wage Inequality?, *International Review of Economics and Finance*, 19(1), pp. 166-172.

Mandal, B. and S. Marjit (2012) – Capital Inflow, Vanishing Sector and Wage Distribution in an Economy with Corruption related Intermediation. *Economics Bulletin*. 32(3), pp 2128-2135.

Mandal, B. and S. Marjit (2013) – Trade Reform, Intermediation and Corruption. *Economic Modelling*. 33, pp 741-746.

Marjit, S. (2003) – Economic reform and informal wage: A general equilibrium analysis. *Journal of Development Economics,* 72(1), pp 371-378.

Marjit, S. (2005) – *Complementarity and International Trade: on some recent development in structural general equilibrium models*. In S. Lahiri and P. Maiti (Eds) Economic Theory in a changing world: Policy making for growth, OUP.

Marjit, S. (2008) – *International Trade and Economic Development: Essays in Theory and Policy,* OUP, New Delhi.

Marjit, S and B. Mandal (2012) - Domestic Trading Cost and Pure Theory of International Trade. *International Journal of Economic Theory,* 8(2), 165-178.

Marjit, S. and S. Kar (2011) – The Outsiders: Economic Reform and Informal Labor in a Developing Economy, OUP, New Delhi.