Economic Modelling 33 (2013) 741–746

Contents lists available at SciVerse ScienceDirect

Economic Modelling

journal homepage: www.elsevier.com/locate/ecmod

Trade reform, intermediation and corruption ☆

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ARTICLE INFO

Article history:
Accepted 30 May 2013

JEL classification:
D73
F1
F11
D5

Keywords:
Corruption
International trade
Tariff reform
General equilibrium

ABSTRACT

We construct a general equilibrium model with a protected intermediate sector and analyze the effectiveness of trade reform for a small open economy where bureaucratic corruption arises because of trade protection. Intermediaries are employed by the producers in order to avoid paying the import tariff. We use an HOSV kind of framework to prove whether trade liberalization necessarily leads to a decline in intermediation activities. We find that labor intensity of the exportable commodity which uses the intermediate good is critical in determining the extent of corruption. It is essentially a tug of war between higher tariff revenue and higher wage in the new equilibrium. Thus trade liberalization may or may not lead to less corruption.

1. Introduction

Following the seminal paper of Krueger (1974) several authors have analyzed the impact of restrictive trade practices on directly unproductive rent-seeking activities. Notable among them are Goldberg et al. (2010), Conlon and Pecorino (1998), Mitra (1989), Yeldan and Roe (1991), Krishna and Mitra (1998), Hillman (1992) etc. Since the developing world in general used to be the hotbed of explicit protectionism, host of papers also discussed how such an anti-trade strategy proved to be detrimental to the general progress of the economy. Bhagwati and Desai (1970) provided a landmark contribution in this context dealing with the plight of the Indian economy. Endogenous formation of tariffs, a general phenomenon affecting the world at large, has been discussed by many inspired by the early works of Mayer (1984), Mayer and Riezman (1987) and subsequently by the well known paper of Grossman and Helpman (1994). In the 60s, 70s and even 80s the anti-trade policies used to be heavily criticized and quite reasonably.[1]

The world has moved on since then. China and India, two of the fastest growing economies in the world have reduced their tariffs substantially over the years thanks to the negotiations at the WTO. There are critical unresolved issues, but an era of reform has set in and the entire developing world in some form or the other has responded to such transformation. Has a decline in the intensity of protection done much to trade related corrupt activities? This is clearly an empirical question. Before one attempts to answer, it is instructive theoretically to explore whether a decline in tariff reduces the number of people engaged in the trade related corrupt activities. In a different context Biswas and Sengupta (2011) has discussed the issue of trade liberalization and corruption.

The actual process of engaging in trade, import or export is observed to involve a large number of people and processes. Degree of trade restriction entails not only specification of tariff rate but also the whole set of procedural complications, and agents and intermediaries who facilitate such transactions by bridging the gap between actual trader and bureaucracy. Such intermediation can be legitimate or illegal. These activities are service related generating wage and employment. They are not usually officially recorded, but are very much part of the

☆ This is a thoroughly revised version of an earlier draft with a different title. Biswajit Mandal is thankful to Hamid Beladi, Rick Bond, Brati Sankar Cakrabarti, Uday Bhanu Sinha and Noritsugu Nakanishi for insightful comments. This paper is also benefitted from the constructive suggestions of seminar participants at IIFT, Kolkata, Kobe University, Japan and Chukyo University, Japan. Authors would like to thank the anonymous referee for some interesting comments and suggestions. Biswajit Mandal gratefully admits the financial support from JSPS. Sugata Marjit acknowledges the financial assistance from the RBI endowment at CSSSC. However, we retain sole responsibility for any remaining errors.

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[1] Interested readers are requested to look at Bhagwati (1988), Helpman and Krugman (1989), Anderson and Wincoop (2001), Greenaway et al. (1998), Krueger (1998), Rodrick (1992), Sachs and Warner (1995), Wacziarg and Welch (2003), Marjit (2008) etc. for some more interesting issues in this line.

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http://dx.doi.org/10.1016/j.econmod.2013.05.022

aggregate economic activity and immensely visible in the entire developing world. In a recent paper Marjit and Mandal (2012) drawing on a clue from Falvey (1976) explicitly model these activities as a non-traded service sector and derive implications for pattern and volume of trade. Hence the timely question arises that does a decline in tariff reduce the size of the intermediary activities.

The general equilibrium model we construct incorporates an importable intermediate whose price comes down as the tariff is reduced. This definitely helps the production of the final good. In fact in a recent paper Goldberg et al. (2010) have shown how liberalizing input trade has contributed to the growth of the Indian economy. Such a decline in tariff has factor market implications. A rise in wage would always eat into the size of the corrupt sector as people have to be paid higher wage. But the tariff revenue can move either way. We provide several alternative scenarios and fairly rich set of results.

The paper is divided into three sections. In Section 2 we describe the model with intuitive solutions and basic results. Last section provides some concluding remarks. However, the relevant mathematical details are relegated to the Appendix A.

2. The model and basic results

Home economy is considered to be a perfectly competitive small one producing two tradeable goods, capital-intensive good X and labor-intensive good Y. There is another sector which produces intermediate input M. Production of M requires labor and a specific factor, T. Hence Y is the exportable and X is the importable for a labor-abundant economy.[2] Production of Y requires capital (K), labor (L) and the intermediate input, M. Producers have two sources for M. One is domestic market and the other is international market where the price is internationally determined and given. Import of intermediate input is subject to tariff. However, M can also be procured from the domestic market but domestic supply is insufficient. Note that intermediate input is relatively cheaper in international market. In order to protect the domestic intermediate input industry government imposes the tariff. Hence, domestic price of M is exactly equal to the tariff inclusive of price of imported M. Producers of Y need to either pay tariff and or pay tariff inclusive price so that the effective price is the same in both cases. No producer is willing to pay honestly as this may result in some form of incentive such as an increase in factor return(s). Thus our economy is characterized by kleptocracy. The amount of advalorem tariff associated with import is t. Producers pay β[3] fraction of t of which a part goes to government coffer and the remaining part goes to the customs officers as premium over their stipulated salary. Despite the fact that the second part does not constitute tariff revenue, this payment is made by the importers. To them it does not matter where it goes. Therefore, it is considered as part of the cost of production. For doing this intermediation a fraction, however small it may be, of labor force needs to be employed. Though a major chunk of the total labor force is absorbed in production of X, Y and M, others get employment due to institutional complexities involved in import. These institutional complexities give rise to corruption activity represented by sector Z. Let us assume that L_Z laborers are used to solve these complexities. This service is not costless: Z workers get w as their wage. We assume competitive market also for corruption to be consistent with the otherwise standard specifications of the competitive general equilibrium model. Note that the structure of this model has some resemblance with Heckscher–Ohlin (H–O) nugget (Gruen and Corden, 1970; Jones and Marjit, 1992), where there is a complementarity in production among commodities. In that sense it is an amalgamation of H–O and specific factor model of trade.

Perfect competition prevails in all markets and production functions for X, Y and M are assumed to exhibit constant returns to scale and diminishing returns to factor inputs.

The symbols and basic equations are in tune with Jones (1965, 1971). In this paper we intimately follow the framework used in Marjit and Mandal (2012) and Mandal and Marjit (2010).

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 land, T; a_{ij} = technological co-efficient; $\overline{K}$ = total supply of capital; $\overline{L}$ = total supply of labor; $\overline{T}$ = total supply of another kind of capital, T; L_Z = labor engaged in corruption activities; t = amount of advalorem tariff on import of M.

Therefore, the general equilibrium structure is like the following:

$$(1-\beta)tP_M^*M^* = wL_Z. \tag{1}$$

Where, $0 < \beta < 1$, and $a_{MY}Y - M^S = M^*$, which is essentially the demand–supply equilibrium for intermediate input. Here, M^* implies imported input and M^S stands for domestic production.

Note that one may effortlessly disagree that one would not be corrupt if $(1-\beta)tP_M^*M^*$ is not greater than the spending for doing intermediation ($=wL_Z$). If this is the case, the corruption sector would be able to generate supernormal profit and more producers would be instigated to carry on with this dishonest practice. But this is not the way how the factual world works. Again, when $wL_Z > (1-\beta)tP_M^*M^*$, no producer would find it rational to be involved in this intermediation. Under this situation labor will flock into corruption sector and hence the viability of the economy would be at stake. In both the above cases the main essence of competitive framework is lost. Therefore, the only condition consistent with competitive general equilibrium framework is what we have written in Eq. (1). On the other hand, for the survival of domestic input producing sector this equality has to hold good. Precisely that is why the cost of procuring intermediate input from both domestic and international markets is the same. If we had tried to model corruption, one could have thought of a punishment cost or anticipated punishment cost associated with bureaucratic intermediation.

Competitive price conditions imply:

$$wa_{LX} + ra_{KX} = P_X \tag{2}$$

$$wa_{LY} + ra_{KY} + \left[P_M^*\{(1+\beta t) + P_M^*(1-\beta)t\}a_{MY}\right] = P_Y$$

$$\text{or, } wa_{LY} + ra_{KY} + \left[P_M^*(1+t)\,a_{MY}\right] = P_Y. \tag{3}$$

Though importers of M are paying only β fraction of tariff t, they have spent out the entire saved amount for intermediation. Thus, whatever be the source of input, domestic or international, cost is the same and it is $P_M^*(1+t)$. Hence,

$$wa_{LM} + Ra_{TM} = P_M^*(1+t). \tag{4}$$

Implications of full employment conditions are:

$$a_{LX}X + a_{LY}Y + a_{LM}M^S = \overline{L} - L_Z \tag{5}$$

$$a_{KX}X + a_{KY}Y = \overline{K} \tag{6}$$

$$a_{TM}\cdot M^S = \overline{T}. \tag{7}$$

[2] One can easily define X as the manufacturing and Y as the agricultural sector. The existence of M can also be justified in that case since agriculture has now-a-days become increasingly dependent on some importable intermediate input like machines, chemicals, fertilizers etc.

[3] In this model we shall not focus on endogenizing β. In order to endogenize β one needs to take into account the nature and efficiency of bureaucracy and administration. This would definitely capture an interesting dimension though the focus of the current paper would be somewhat diverted. Similar kind of attempt is made in a recent paper by Chaudhuri and Mandal (2013) where the effects of the improvement of administrative efficiency are discussed at length. Interested readers may look at the paper for detailed analysis.