The equivalence of export subsidies and import tariff reductions in a macroeconomic model

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\section*{Abstract}
A general equilibrium macroeconomic model is used to study the equivalence of export subsidies and import tariff reductions in increasing export output. It is shown that the qualitative effects of both policies are the same; an import tariff reduction is an equally viable alternative for expanding exports. It is also seen that in a typical developing economy with a large nontradable goods sector, the import tariff reduction may well be a better choice in this regard. Hence, when striving for export expansion, developing countries and emerging market nations cannot afford to be lackadaisical in liberalizing imports. This observation may be also related to the argument that it is not possible to nurture a small pocket of advanced export industry in an economy shaded from competition and characterized by inefficiency and low productivity.

\section{Introduction}
Trade liberalization is now being embraced enthusiastically by most countries aspiring to cruise on the path of rapid economic development. Yet, the emphasis in these hopeful economies is on export promotion, an antidote for the policy of import substitution of yesteryears. Import liberalization is often seen as a painful necessity, one without which reciprocal easing of trade barriers will not be forthcoming in trading partners.

In this paper, we set up a macroeconomic model of an open economy, and show that there is, in essence, an equivalence of export subsidies and reductions in import tariffs, in promoting exports. Thus, one may draw the conclusion that giving into the clamor for maintaining import barriers - for protecting domestic import substituting industry- while upholding the aim of export expansion will be self-defeating.

\section{Background of the study: motivation and a brief literature review}

\subsection*{2.1. Exposing the fallacy of export expansion with import constraints}
Unfortunately, it has been often noted that developing countries embarking on trade liberalization often did so with one eye closed (so to say), with the winds of liberalization only allowed to blow on the export sector. The idea that import liberalization can, in fact, even assist in export expansion does not seem to have been entertained by policy makers in most of these developing nations going in for trade reforms.

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\section*{References}
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This seems to have been rather strange, for there is considerable support in the literature for export-enhancing effects of import liberalization. Ahturkoralu (2011) notes that countries with more open trade policies tend to boost revenues from exports. Awokuse (2008), in an empirical study of a group of Latin American nations, strikes a similar chord, writing that export promotion with import constraints may not contribute sufficiently to economic growth – so that the hypothesis of import-led growth may be more valid than that of export-led growth. Much earlier, Weiss (1999) had noted that greater trade liberalization leads to better performance of export performance indicators; in a study of Mexico, he found that as the country moved in the 1980s from an import substitution regime to virtually free trade with the USA, and a reduced general tariff rate of 10% with other countries, manufactured exports boomed. Clements and Sjastaad (1984) had cautioned that protection taxes exporters, arguing that a substantial burden of import protection is borne by exporters through a decline in the price of exports relative to home goods – a result derived explicitly in this paper. They also note that in some countries like Malaysia such an ‘implicit tax’ can be quite high. The present paper differ from these empirically oriented papers in making a direct- theoretical - link between import liberalization and export promotion, so much so that import liberalization can achieve the same effect on export expansion as with that arising with a policy of export subsidization.

The impacts of import liberalization on income and income distribution have also been an intensely discussed topic. These effects have varied between countries, partly due to differences in timing and sequencing. The opening up process itself varied in content and timing between the various developing nations (see, for instance, the discussion in Shafaeddin, 2005). The state of the world economy, the pressures from – and the influence of - the ‘protect infant industry’ groups and consumer welfare groups, have all contributed to the timing and extent of import liberalization policies in developing countries. For instance, in India, where an import substitution (IS) regime had reigned supreme, there was a policy of selective reform that encompassed the manufacturing sector, but left the agricultural sector untouched (Kruger, 2010; Paudel, 2014). In addition, the sequencing of reforms was also faulty in some of the developing countries, with a sudden plunge also into financial liberalization, before the completion of trade reforms – the Philippines being a well-known example, having had to retrace on the reform process after a hasty adoption of financial reforms.

Theoretical work on the effects of import liberalization – besides that on export expansion – on growth and income distribution seems to be scant. A study by Batavia, Chakravarty, and Nandakumar (2008) showed that when the momentous Factor Price Equalization Theorem framework of Samuelson is modified a bit to differentiate between skilled and unskilled labor, opening up to trade may depress the real wages of unskilled workers, while improving the real wages of skilled workers. Thus the burden of proof lies in empirical evidence as far as income distribution effects of import liberalization are concerned. But this is a task that is beyond the scope of the present paper.

Having taken stock of literature in this area, our aim in paper is to explicitly derive a connection between import liberalization and export promotion, indeed, derive equivalence between import tariff cuts and export subsidies. We will set out to prove a theoretical result reminiscent of that in the seminal work by Bhagwati, (1965, 1968), who showed that under conditions of competitive production, there is an equivalence between import quotas and import tariffs.

3. The formal model

Consider an open economy with a nontraded goods (including government goods) sector, an exportable goods sector and an importable goods sector. The price of the exportable good is set abroad, as is the price of the importable good, while the price of the nontraded good is formed in the home market. To keep the model simple, it will be assumed that the imported good is not produced at home; this assumption can be relaxed (please see the Appendix A) without affecting the results derived.

We will be working with relative prices, and choose therefore to omit the financial sector, as is often done in small open economy models (see for example, Helpman, 1977). Adding a monetary sector can facilitate determination of the absolute price level, and can be easily done, but may not enrich the analysis conducted here.

We will be examining the effects of export subsidy provision and tariff reduction policies in this macroeconomic model, chiefly on outputs in the exportable sector. The model can be described by the following equation system:

\[ S_y \left( \frac{w}{P_y} \right) = D_y \left( Y, \frac{P_y}{P_T}, \frac{P_T}{P_T} \right) + G_y + I_y \]  (1)

\[ Y = \frac{P_T}{P_y} S_y \left( \frac{W}{P_T} \right) + S_i \left( \frac{W}{P_T} \right) \]  (2)

\[ \hat{W} = a \hat{P}_T + \beta \hat{P}_y + 1 \hat{P}_y \]  (3)

\[ \hat{W}_T = \hat{W} + \hat{q} \]  (4)

\[ \hat{P}_T = 1 \hat{P}_y + \hat{\xi} \]  (5)

Eq. (1) presents the equilibrium condition for the nontraded goods market. The supply \( S_y \) is dependent on the real product wage \( \left( \frac{w}{P_T} \right) \) in the sector. \( D_y \) is private consumption demand, moving with real income ‘\( Y \)’ and the relative prices \( \frac{P_y}{P_T} \) and \( \frac{P_T}{P_T} \), \( P_T \) and \( P_T \) being the
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