

Title	LERNER'S SYMMETRY THEOREM REVISITED
Sub Title	
Author	CASAS, Francois R.
Publisher	Keio Economic Society, Keio University
Publication year	1991
Jtitle	Keio economic studies Vol.28, No.1 (1991.) ,p.15- 19
JaLC DOI	
Abstract	We show that the equivalence between import and export taxes --first demonstrated by A. P. Lerner-- does not imply that the effects of import and export subsidies are equivalent, nor can an inference be drawn that a trade subsidy is equivalent to a negative trade tax.
Notes	
Genre	Journal Article
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AA00260492-19910001-0015

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LERNER'S SYMMETRY THEOREM REVISITED

François R. CASAS

Abstract. We show that the equivalence between import and export taxes —first demonstrated by A. P. Lerner— does not imply that the effects of import and export *subsidies* are equivalent, nor can an inference be drawn that a trade subsidy is equivalent to a negative trade tax.

It has been over fifty years since Abba Lerner (1936) demonstrated that the impact on the volume and on the terms of trade of a given *ad valorem* tax would be the same whether it is levied on imports or exports. It has generally been assumed that this symmetry (or, more properly, *equivalence*) extends to import and export subsidies on the ground that such subsidies are merely negative taxes.¹

The purpose of this note is to question the validity of these two inferences drawn from Lerner's classic analysis, namely (1) that a trade subsidy may be viewed and treated as a negative trade tax with symmetric effects, and (2) that there exists an equivalence between the effects of subsidies on imports and on exports.

I. THE ASYMMETRY BETWEEN IMPORT TAXES AND SUBSIDIES

In Figure 1, TT' represents the production possibility boundary for a small economy whose terms of trade as shown by the line P_w .² Under free trade and in the absence of transport costs, domestic prices will equal world prices ($P_d = P_w$), with this economy producing the basket P and consuming at C .

With p_e and p_m denoting, respectively, the world prices of the exportable and importable commodities, and *ad valorem* nonprohibitive tariff t_m on imports will induce domestic suppliers to raise their price to the level of the tariff-augmented cost of imports. The domestic commodity price ratio is then

$$P_d^1 = p_e / [(1 + t_m)p_m] = P_w / (1 + t_m) < P_w .$$

With domestic consumers and producers facing P_d^1 , production shifts to P_1 and consumption to C_1 in Figure 1.

The conviction that an import subsidy will lower the selling price for firms in

¹ Chacholiades (1978, pp. 458–61) points out that whereas the government may spend the tax revenue itself or distribute it to the private sector, it must be assumed that the government will raise the revenue needed to finance a subsidy through an income tax on private consumers.

² For a country possessing monopoly or monopsony power in trade, it is necessary to analyse the effects of a tax or subsidy on the supply of exports and the demand for imports *at the initial terms of trade* in order to explain its effect on the equilibrium terms of trade. The relevance of our model is thus not diminished by the small country assumption adopted here.

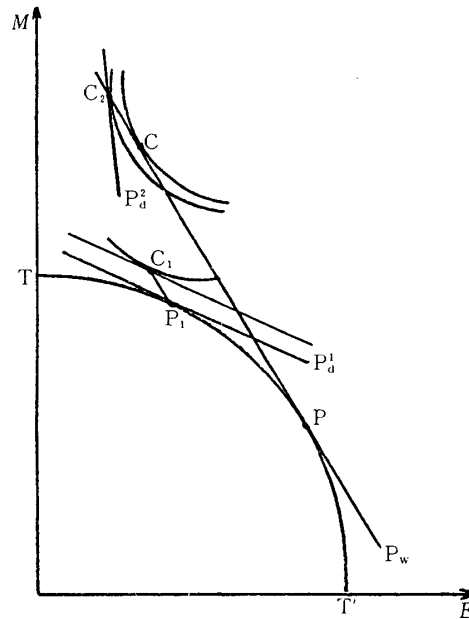


Fig. 1

the import-competing sector stems from the assumption that competition will force those firms to match the lower subsidized cost of imports. However, in the absence of transport costs, domestic firms retain the option of selling their product in foreign markets at the higher world price. We would consequently expect that the entire domestic output will be exported at the latter price while all domestic consumption will be satisfied with subsidized imports.³

It follows that the effects of an import subsidy will not be symmetric or opposite to those of an import tax. Unlike the tax, a subsidy would give rise to intraindustry trade in the subsidized commodity.⁴ Furthermore, an import subsidy would *not* affect the domestic price of the importable for producers while lowering it for consumers, making it indistinguishable from a *consumption subsidy* in terms of its allocative effects. In Figure 1, these effects are shown with production remaining at P following the introduction of the subsidy, while consumption shifts to C_2 with domestic consumers facing a price ratio given by

$$P_d^2 = p_e / [(1 - s_m)p_m] = P_w / (1 - s_m) > P_w,$$

where s_m is the *ad valorem* subsidy rate.

It also follows that in the case of a large country, the effect of an import tax on the equilibrium terms of trade would not be symmetric to that of an

³ This is equivalent in its effect to domestic firms routing their sales in the domestic market through the foreign market to escape the negative protection of the import subsidy. Of course, the government may adopt rules restricting the subsidy to units produced abroad, but such rules would not eliminate the incentive for domestic firms to export their output.

⁴ Alam (1988) has recently shown that two-way trade may also result from the imposition of an import quota when the domestic import-competing sector is monopolistic.

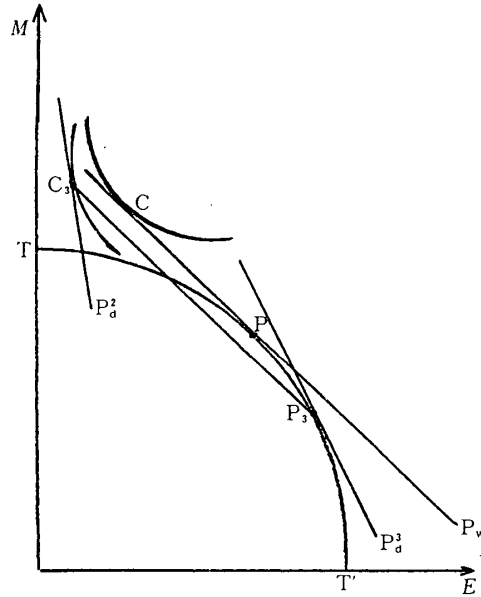


Fig 2

equiproportionate import subsidy. A given tariff will reduce the demand for imports more than an equal subsidy would increase the *net* demand since the tariff simultaneously expands domestic production and curtails domestic consumption, while the subsidy increases net imports only as a result of the increased domestic consumption. Consequently, for a given elasticity of the foreign offer curve we expect that the terms of trade effect of a tariff will be opposite to, but also larger than that of an equiproportionate subsidy.

Finally, it should be noted that the incorporation of transport costs will not necessarily invalidate these results. For the sake of simplicity, assume that transport services are supplied by other countries and that the cost of transporting and insuring a unit of the importable commodity is a fixed proportion of its world price, f_m .⁵ The introduction of an import subsidy at a rate s_m of the f.o.b. world price of the importable commodity, p_m , will lower the domestic consumption price to $[p_m(1+f_m-s_m)]$. Domestic firms may sell in the domestic market at this price or export their product at a price $p_m(1-f_m)$. It follows that all the domestic output will be exported if $s_m > 2f_m$, that is, if the subsidy exceeds the unit *roundtrip* cost.⁶ In this case, the domestic producer price will decline but less than the consumer price as shown in Figure 2 where the import subsidy shifts production to P_3 [with the slope of P_d^3 equal to $P_w/(1-f_m)$] and consumption to C_3 [with

⁵ See Casas (1981, 1983) for a discussion of the implications of domestically supplied transport services and the definition of the terms of trade in their presence.

⁶ Any import taxes levied by the foreign countries would also have to be taken into account. It is worth noting that there is a considerable variation in transport costs among commodities and countries. For example, Prewo (1978) found that for eight Latin American countries, transport costs ranged from a low of 4.73 percent of f.o.b. export prices to a high of 214.01 percent in 1966.

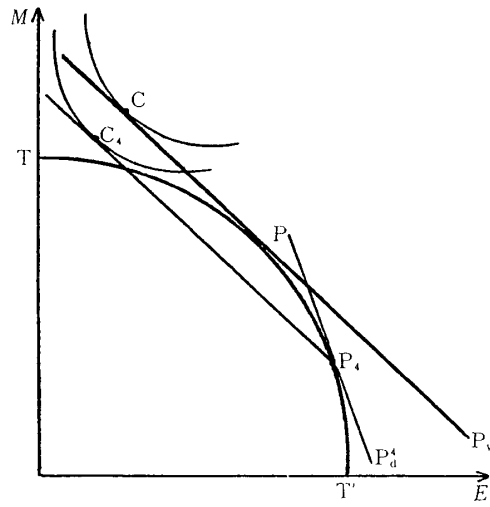


Fig.3

the slope of P_d^2 equal to $P_w/(1+f_m-s_m) > P_w/(1-f_m)$.

II. THE NONEQUIVALENCE OF IMPORT AND EXPORT SUBSIDIES

Just as import-competing firms will not lower their price when imports are subsidized, in the same manner domestic consumers will not pay a higher price when exports of a commodity are subsidized since they will be able to purchase that commodity in foreign markets at the world price.

As pointed out by Allam (1989), this implies that an export subsidy will also give rise to intraindustry trade, with the entire domestic output exported at the higher subsidy-augmented price and the entire domestic demand satisfied with imports at the lower world price.⁷ The export subsidy thus becomes indistinguishable from a *production subsidy* which raises the domestic price for producers but not for consumers. In Figure 3, P_d^4 reflects the higher domestic relative price of the exportable good, with

$$P_d^4 = [P_e/(1-s_e)]/P_m = P_w/(1-s_e) > P_w,$$

where s_e is the subsidy rate. This export subsidy shifts production to P_4 and consumption to C_4 .

More relevant to our analysis is the fact that while equal import and export taxes affect domestic prices, production and consumption levels identically, the same is not true of import and export subsidies. An import subsidy was shown to be equivalent to a consumption subsidy affecting the domestic demand for tradable commodities but not the domestic allocation of resources, whereas an export subsidy is equivalent to a production subsidy which affects the domestic

⁷ Allam (1989) explicitly considers the implications of transport costs as well as the case where the domestic industry is a monopoly.

supply of tradables. In the latter case, consumption is also affected, but only through the *income effect* of changed output levels (as may be seen in Figure 3).

Finally, it should be observed that while both import and export subsidies are immiserizing, their impact on aggregate welfare may differ. An import subsidy generates a consumption (or exchange) loss while an export subsidy results in a production (or specialization) loss. It is not possible therefore to determine *a priori* which subsidy will inflict the greatest damage.

III. SUMMARY AND CONCLUSIONS

The analysis has shown that in the absence of transport costs, import taxes and subsidies are not symmetric, and neither are export taxes and subsidies. Furthermore, while import and export taxes are equivalent as argued by Lerner (1936), import and export subsidies are not equivalent. With transport costs, these results hold when subsidy rates exceed the roundtrip unit cost of tradable commodities.

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REFERENCES

- Alam, M. Shahid (1988), Domestic monopoly, quotas, two-way trade and tariff-equivalence. *Southern Economic Journal*, **55**, 202–5.
- Alam, M. Shahid (1989), Transaction costs of trade: some partial equilibrium results. *Southern Economic Journal*, **57**, 323–9.
- Casas, F. R. (1981), Transport costs in the pure theory of international trade: some comments. *The Economic Journal*, **91**, 741–4.
- Casas, F. R. (1983), International trade with produced transport services. *Oxford Economic Papers*, **35**, 89–100.
- Chacholiades, Miltiades (1978), *International Trade Theory and Policy*. New York: McGraw-Hill.
- Lerner, A. P. (1936), The symmetry between import and export taxes. *Economica*, **3**, 306–13.
- Prewo, W. (1978), The structure of transport costs on Latin American exports. *Weltwirtschaftliches Archiv*, **114**, 305–27.