On the Symmetry between Import and Export Quotas

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Abstract

If a country wants to restrict its trade, it can use an import tax or an export tax. Their effects on the terms of trade and domestic relative prices are identical. This is Lerner's symmetry theorem. This paper attempts to show that Lerner's symmetry theorem also holds between import and export quotas if the foreign elasticity of demand for imports is elastic.

If a country wants to restrict its trade, it can use an import tax or an export tax. Their effects on the terms of trade and domestic relative prices are identical. This is Lerner's symmetry theorem.[1] The purpose of this paper is to study if Lerner's symmetry theorem also holds between import and export quotes. It will be shown below that Lerner's symmetry theorem also holds between import and export quotas if the foreign elasticity of demand for imports is elastic. The offer curve approach will be used in this study. It is assumed that there are no inferior goods.

In Figure 1, OA and OB are the offer curves of the home country A and the foreign country B, respectively. (Country B's elasticity of demand for imports is assumed to be elastic.) Point a is the equilibrium trading point under free trade. Now, suppose that country A would like to use an import quota or an export quota to restrict trade to point b.

First, examine the case where import quota and export quota revenues are spent

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1. A.P. Lerner, "The Symmetry between Import and Export Taxes, "*Economica,* August 1936, pp. 306-313 : J.E. Meade, *A Geometry of International Trade,* (1952, George Allen and Urwin), pp. 44-51 : Jagdish N. Bhagwati and T.N. Srinivasan, *Lecutures on International Trade* (1983, MIT Press), pp. 108-111.

come OCDEF, which intersects OB at b. Line Ob will measure the new equilibrium terms of trade. The private sector will reach the welfare level represented by the trade indifference curve It_{10}. The domestic price ratio in country A will be measured by the slope of It_{10} at b.

Figure 1

On the other hand, an export quota is used instead, country A's offer curve will become OCH, which also intersects OB at b. The private sector will reach the trade indifference curve It_{10}. Like import quota case, the new terms of trade is measured by line Ob and the domestic price ratio is measured by the slope op It_{10} at b. This shows that Lerner's symmetry theorem also holds between import and export quotas when import

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2. It is assumed that the government raises import quota revenues or export quota revenues through competitive auctions. Then these revenues are redistributed back to the private sector in the form of lump-sum transfers.

quota and export quota revenues are spent by the private sector.

Next, consider the case where import quota and export quota revenues are spent by the home government. When an import quota is used, country A's offer curve becomes OCDEF. Line Ob will measure the terms of trade. However, in this case, the domestic relative prices will depend on how the government spends the import quota revenue. If the government spends the import quota revenue entirely on the home exportable good X, then line OE will be the domestic price line. The private sector uses OJ of good X to exchange for EJ of the home importable good M, whereas in the international market, country A uses only OG of good X to exchange for bG good M. Eb of good X is the import quota revenue which is appropriated by the government. The welfare of the private sector will be represented by the trade indifference curve It$_7$.

If the government spends the import quota revenue entirely on the importable good, then the domestic price line will be OC. The private sector uses OG of good X to exchange for CG of good M, whereas in the international market, country A uses OG of good X to exchange for bG of good M. Cb of good M is the import quota revenue which is appropriated by the government. The welfare of the private sector will be represented by the trade indifference curve It$_3$.

In case that the government wants to spend the import quota revenue on both goods X and M, the domestic price line will lie between lines OC and OE. For example, the domestic price line will be OD if the government spends the import quota revenue partly on the exportable good (DQ of good X) and partly on the importable good(Qb of good M).

On the other hand, when an export quota is used instead, country A's offer curve becomes OCH. Line Ob will measure the terms of trade. Like the import quota case, the domestic price line could be OE, OC, or could lie somewhere between OE and OC, depending on whether the home government spends the export quota revenue entirely on the exportable good X, entirely on the importable good M, or on a combination of both goods, respectively. This can be explained as follows.

Although country A's offer curve becomes OCH under the export quota, section CA of the original offer curve OA still describes how the private sector would hehave when faced with different relative prices. Thus, if the government wants to spend the export quota revenue entirely on the exportable good X, then line OE will be the domestic price line. The private sector would pay OJ of good X for JE of good M. Out of OJ of good X, OG(which is the export quota) is exported to country B in exchange for Gb of good M. The remaining GJ of good X is the export quota revenue which is appropri-

ated by the government. The welfare of the private sector will be represented by the trade indifference curve It₇.

·   If the government wants to spend the export quota revenue entirely on the importable good M, then the domestic price line will be OC. The private sector would pay OG of good X for CG of good M. OG of good X (which is the export quota) is exported to country B in exchange for Gb of good M. Cb of good M is the export quota revenue which is appropriated by the government. The welfare of the private sector is represented by the trade indifference curve It₃.

In case that the government wants to spend the export quota revenue on both goods X and M, the domestic price line will lie between lines OE and OC. For example, the domestic price line will be OD if the government spends the export quota revenue on DQ of good X and Qb good M.

It is clear now that Lerner's symmetry theorem also holds between import and export quotas even for the case where import quota and export quota revenues are spent by the government. This is true as long as the goverment's pattern of expenditure is the same under both import and export quotas.

However, Lerner's symmetry theorem does not hold of country B's elasticity of demand for imports is inelastic. This is in Figure 2. Suppose that country A wants to re-

Figure 2
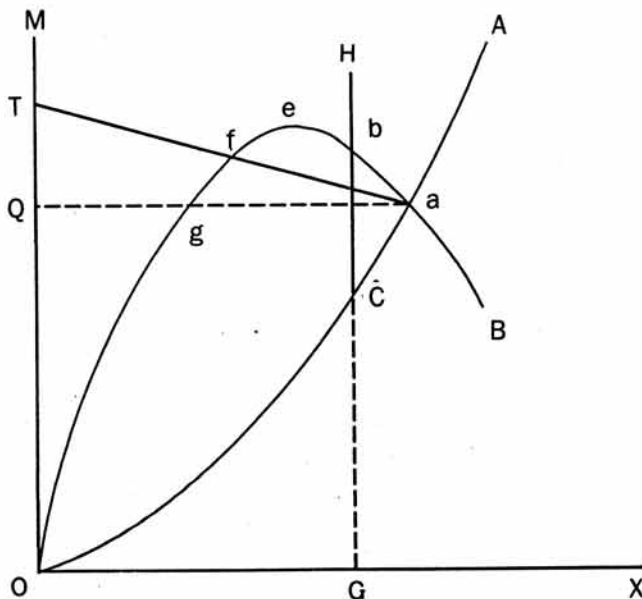
strict trade to point b, An export quota of OG will bring country A to point b. Point b. however, can not be reached with an import quota. For an import quota to be binding, it has to be less than OQ, which is the amount of imports under free trade.[3]

In conclusion, it has been shown in this paper that Lerner's symmetry theorem also holds between import and export quotas if the foreign elasticity of demand for imports is elastic. This is true whether import quota and export quota revenues are spent by the private sector or by the government. For the case where the foreign elasticity of demand for imports is inelastic, Lerner's symmetry theorem does not hold.

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3. It may be argued that even though point f (or any point between points g and e on the foreign offer curve OB) falls within the elastic portion of the foreign offer curve OB, Lerner's symmetry theorem still does not hold at point f. This problem can be solved in the arc elasticity concept is used. The foreign elasticity of demand for imports between points a and f is still less than one (measured by OQ/OT). See J.E. Meade, op. cit., p.88.