The Choice between a Tariff and a Quota under Uncertainty

By

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Introduction

Meade [1955, p. 175] argues that a tariff and a quota will have different effects on price and quantity imported in situations with changes in demand and supply. The question of the effects of the two kinds of instruments in case of uncertainty has been further analysed by Fishelson and Flatters [1975], Pelcovits [1976], and Dasgupta and Stiglitz [1977]. Within the framework of partial models these articles compare a tariff and a quota in terms of social welfare measured as consumers' (and producers') surpluses. The first two articles use excess demand for imports only, and do not consider domestic demand and supply separately. The last article considers both domestic demand, domestic and foreign supply, but assumes that import requirements of the country considered do not influence the foreign price.

Fishelson and Flatters examine which of the two instruments maximizes expected utility under the assumption of a finite elasticity of foreign supply. Their conclusion is that a tariff is preferable to a quota, except in cases of an inelastic supply of foreign goods and uncertainty about domestic demand for imports. In the latter case a quota is preferable.

Pelcovits analyses the loss in expected utility using a tariff and a quota to restrict to a certain level the expected quantity imported. He finds that the loss is minimized by the use of a tariff except in case of uncertainty about foreign supply and a tariff rate above 100 per cent. In this case the loss is minimized by the use of a quota. Only the expected quantity imported and, strangely enough, not the uncertainty in the determination of this quantity is considered in the evaluation of the two instruments.

Dasgupta and Stiglitz analyse the same kind of problem assuming that the government for some reason, not discussed, wants a given ex-

Remark: Helpful comments from an anonymous referee are gratefully acknowledged.
pected revenue from a tariff or a sale of quotas. With an infinite elasticity of foreign supply the expected utility measured by the consumers' and producers' surpluses is then maximized. For a not too large revenue and uncertainty with respect to demand and supply they find that "a pure tariff is unambiguously superior to a pure quota in generating a given expected level of government revenue" (p. 979), i.e. almost the same result as Pelcovits'.

All three articles mentioned evaluate the choice of instruments by comparing the expected values of the consumers' (and producers') surpluses. In a macroeconomic context the intention of the authority of restricting imports, however, is often to affect employment and the balance of payments. Accordingly, it is also desirable to evaluate a tariff and a quota with respect to the quantity domestically supplied (i.e. employment) and imports. For such an evaluation it may be assumed that the certainty of the determination of the desired objective is important for the choice between the two instruments.

The purpose of this note is to compare the uncertainties of using a tariff or a quota in the determination either of the quantity domestically supplied or the value of imports in case of uncertainty about demand and supply functions. In addition to a stochastic behaviour of the various demand and supply functions, this question also deserves attention in a longer-term perspective because of possible domestic and international considerations precluding frequent policy changes.

I. Uncertainty, Production and Imports

It is assumed that a quota is implemented in such a way that the value of the import licences (the implicit tariff) either goes to the government (through sales) or goes to the domestic importers (through allotments). This assumption together with perfect competition among foreign producers will ensure that the foreign price remains on the foreign supply curve. Furthermore, it is assumed that perfect competition prevails among domestic consumers and producers; no tendency to monopoly caused by the sales or allotments of import licences is present. Transaction and adjustment costs are disregarded. As a partial model is used, the possibility of repercussions on exports and other items of the balance of payments is disregarded. The same limitation applies to the effects of changes in the distribution of wealth.

2 The way of analysing the stated problems is inspired by Poole [1970], but he discusses the choice of instruments of monetary policy.