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A NOTE ON DOMESTIC LEVY POLICY FOR BEEF

Kevin A. Parton*

The beef industry is passing through a particularly difficult time at present, and there have been calls from various parts of the industry for policy intervention. Stabilization of producers' returns would seem to be the goal of such intervention. The purpose of this note is to identify, by means of a relatively simple analysis, the conditions needed for successfully employing a policy of taxing domestic consumption of beef (with proceeds being returned to the producer) to increase producer returns from current low levels, and hence to provide a degree of stability. The tax would essentially be a short-run policy.

This policy is being examined because it represents part of a proposed buffer fund scheme that various interests in the beef industry seem to be considering [1, 2, 6]. Several slightly different schemes have been put forward, but the Queensland Department of Primary Industries' "Proposed Beef Industry Stabilization Scheme" [6, p. 1] is fairly typical, and involves:

(i) a levy on beef and veal sold for domestic consumption when prices to producers are low;

(ii) a levy on beef and veal exported when prices to producers are at relatively high levels; and

(iii) the establishment of a Beef Industry Stabilization Fund into which all levies would be paid and from which funds would be drawn to assist beef producers when returns fall below acceptable minimum levels.

In subsequent periods of low prices, stabilizing funds could be drawn from both the consumption levy in the given period and export price levies in (then) previous periods. The analysis presented here is essentially an examination of part (i) of the scheme in the first period of operation, and is relevant to the current situation. Other cases are not considered because hypotheses about the structure of future markets relevant to part (ii) would be very tentative.

It is not intended to review the various methods of administering this scheme, but some clarification of the institutional arrangements must be made before commencing any analysis.

Firstly, a criterion for eligibility to receive payment of levy proceeds must be established. The analysis presented below is based on a particular

* Department of Agricultural Economics and Business Management, University of New England.

version of a buffer fund scheme in which all producers supplying a given minimum quantity of beef would be eligible for levy payments, whether or not their output was consumed domestically. The funds would be distributed to farmers depending on the quantity and type of beef supplied. This type of scheme has certain advantages over one where funds are only distributed to producers supplying the domestic market. If distribution was so organized, then it would be necessary to restrict the right to supply the domestic market, because producers would act as though the effective price received on the domestic market was the actual price paid plus the levy. This would tend to cause beef to be transferred from overseas markets to the Australian domestic market until levy plus actual domestic price was equal to export price. The scheme under consideration avoids this problem because there is no inducement to switch beef between markets.

The second administrative aspect concerns the stage in the marketing chain at which the domestic levy would be collected. Here, the proposals of the Queensland Department of Primary Industries [6, pp. 4–8] seem quite valid and will be briefly summarized.

Collection at wholesale level was rejected because this would allow the retailer to consider the levy as part of his costs and he could be expected to inflate his marketing margin accordingly. Secondly, exporters may be able to purchase beef and veal for the overseas market, but may subsequently divert it to the domestic market, thereby avoiding levy payments. Retail collection of the levy should avoid such drawbacks. Given that collection is to be at the retail stage, then a levy based on wholesale price paid by the retailer would appear to pose less administrative difficulties for the retailer than one based on retail sales. In addition possibilities of avoiding levy payments would be less.

To carry out the analysis of the domestic levy part of the buffer fund policy with any exactitude would require the precise specification of home and international demand schedules for beef. These seem to be unavailable, and even if they were readily at hand, they would no doubt be a year or so out of date. Nevertheless several observations can be made:

(a) The world demand curve for Australian beef[1] probably resembles that of Figure 1, and is subject to periodic shifts between D_1 and D_2. These shifts occur as a result of factors such as variations in the level of self-sufficiency of the countries to which Australia exports.

(b) The U.S.A. takes about two-thirds of Australian exports and has operated a quota system designed to protect the domestic beef industry from relatively low-priced beef imports. Freebairn and Gruen [4] suggest that the U.S. demand for Australian beef is probably highly price responsive in periods of relatively high U.S. beef prices, and is price unresponsive in times of low and average prices. Further they note that of the remaining export markets, which take about one-third of Australian beef exports, Japan is price unresponsive at all times, and only the E.E.C.

[1] Beef is considered to be an homogenous commodity, or with a high degree of substitutability between types.

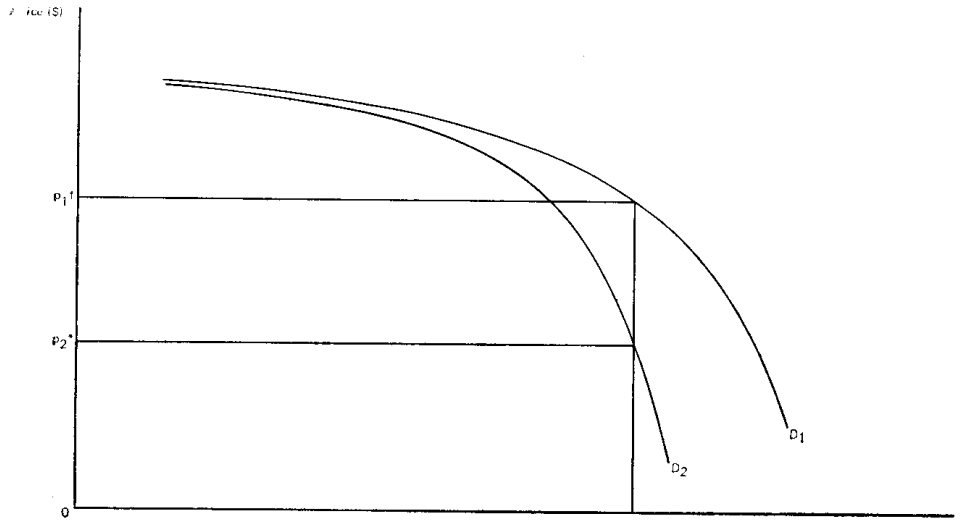

FIGURE 1: Foreign Demand Curves for Australian Beef

*p_2: current price

†p_1: more usual price situation

and other countries are likely to be price responsive. The E.E.C. specifies an aggregate import requirement, and competition for this market takes place between Australia, New Zealand and Latin American countries. The other importing countries operate various domestic policies, but can overall be regarded as a competitive sector of the overseas market. The conclusion is that 75 to 80 per cent of Australian beef exports are currently being sent to price-unresponsive markets [4, p. 16]. Thus beef exports are restricted, chiefly by foreign countries' quota arrangements, and curve D_2 (Figure 1) is the one that seems more applicable. Relatively low prices prevail so that the Australian beef exporter is probably operating on an inelastic part of the overseas demand schedule for Australian beef.

(c) Various studies have indicated that the domestic price elasticity is quite high [5], [7, p. 199–217], [4, p. 18–20], being somewhere between -0.9 and -1.5. However, these studies were carried out when prices were relatively high. It seems more probable that at current low domestic price levels, demand is quite inelastic with respect to small changes in price [6, p. 2]. This depends largely on the changing relative prices of beef and substitute meats.

The imposition of a levy or tax on beef sold for domestic consumption can be analysed with Figure 2 which is a "back to back" trade diagram showing both domestic (D_d) and foreign (D_f) demand curves for Australian beef. For simplicity, transportation costs are ignored because they do not affect the analysis. Assuming markets are competitive, total revenue from the sale of Australian beef, before the introduction of the tax, is represented by the sum of the rectangles *abcO* and *ABcO*. Imposition of a tax on domestic sales would cause domestic prices to rise and domestic consumption to fall. If the further assumption is made that the total of

domestic beef consumption plus exports remains at its 1974–75 level[2], larger amounts of beef must be exported, at a lower price. In Figure 2, the tax per unit is *Gg*, and the total producer revenue, with the tax proceeds transferred to the producer, is *efgO* plus *EFGO*.

Whether or not there is an increase in producer revenue as a result of the tax depends on the price elasticities of demand for Australian beef both at home and abroad. The price on the home demand schedule is moving upwards, so that an inelastic curve is required to increase the sum of producer returns plus tax from the home market. The price abroad for Australian beef moves downward as a result of the tax. This implies that an elastic demand curve for Australian beef is required on the international market to increase producer returns there. Thus a sufficient, though not necessary, condition for producer revenue to increase as a result of the tax is that the home price elasticity of demand lies between 0 and -1, whilst the foreign price elasticity is between -1 and $-\infty$.

A set of results which apply to different elasticities in the two demand curves is shown in Table 1. The policy under consideration is a 10 cent per kg tax on beef sold to the domestic market, given an average price at retail of 112 cents per kg.

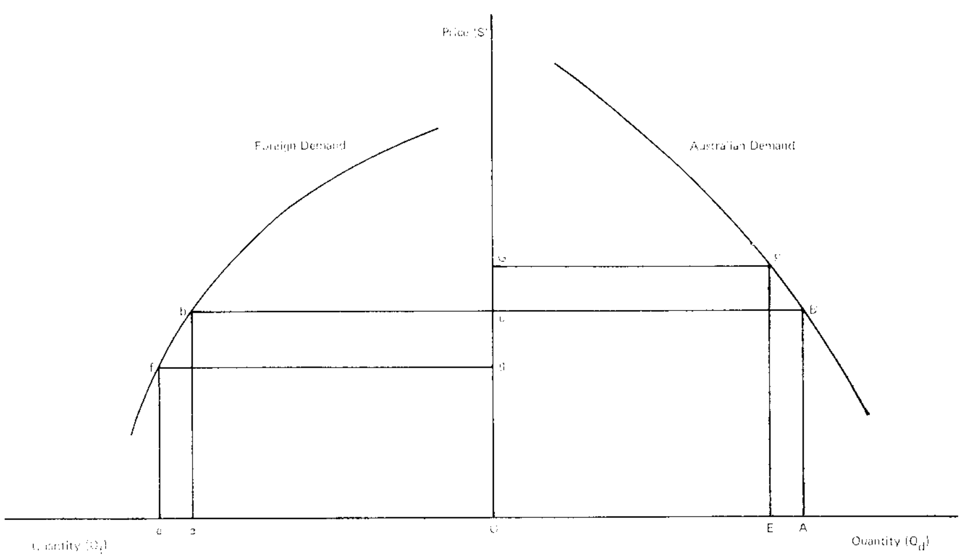

FIGURE 2: [illegible] Showing the Effects of the Domestic Levy on Domestic and Foreign Demand.

[2] Exports (carcase weight) 417 000 tonnes, domestic consumption 868 000 tonnes. Source: B.A.E. [3, p. 40].

TABLE 1: *Expected Changes in Producer Revenue and Export Receipts as a Result of Imposing a* 10 *cent Levy on Domestic Consumption with Proceeds Returned to Producers*

E_d	E_f	Tax ($m)	Producer revenue gain ($m)	Change in Export receipts ($m)
−0.2	−0.2	86.0	+ 2.1	−22.3
−0.5	−0.5	85.5	+ 1.3	−14.7
−1.0	−1.0	84.2	0	0
−2.0	−2.0	81.7	− 2.5	+26.5
−1.5	−2.0	82.1	+ 7.7	+25.5
−1.0	−2.0	83.0	+21.0	+21.0
−0.9	−1.1	84.2	+ 6.0	+ 2.6
−0.5	−1.0	84.9	+21.9	0
−1.0	−0.5	85.2	−15.8	− 3.0
−1.1	−0.9	84.3	− 5.5	−16.8

There are two main conclusions in relation to producer revenue[3]:

(1) The policy will be more successful, the more elastic is the foreign demand curve and the less elastic is the home demand curve.

(2) Even if the policy is successful, the benefits of the policy seem to be slight in relation to the effort required to bring them about. Even under the most favourable elasticity conditions a tax in excess of $84 million would be required to bring about a $21.9 million producer revenue gain. That is, the 10 cent per kg tax, with the proceeds distributed to producers, would increase overall producer returns by 1.7 cents per kg.

Thus, it seems that part (i) of the buffer fund policy would only be successful under rather extreme elasticity conditions. Assuming such conditions prevail, then the effort to bring about a small improvement in the position of producers under this policy would involve a significant loss of consumers' surplus in Australia, a relatively large tax, and a transfer of substantial benefits to overseas consumers of Australian beef. These factors tend to cast doubt on the chances of success of the buffer fund scheme, unless substantial benefits could be recouped if and when a high price regime returns, and part (ii) of the scheme can be put into operation.

[3] Note in addition there are numerous subsidiary effects such as the production/marketing sector having to collect the tax and therefore apparently making a loss in the process. A loss which is of course later refunded.

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