D The sensitivity of the demand for gambling to price changes

Unfortunately, very little reliable data are available on the price sensitivity of the demand for gambling as a whole or for particular gambling activities. This appendix examines what is known about the demand for different forms of gambling. It concludes that most forms are unlikely to be particularly sensitive to changes in price, although there is likely to be significant variation in price sensitivity among different gambling forms.

Two factors explain, at least in part, why most gambling forms are relatively insensitive to price:

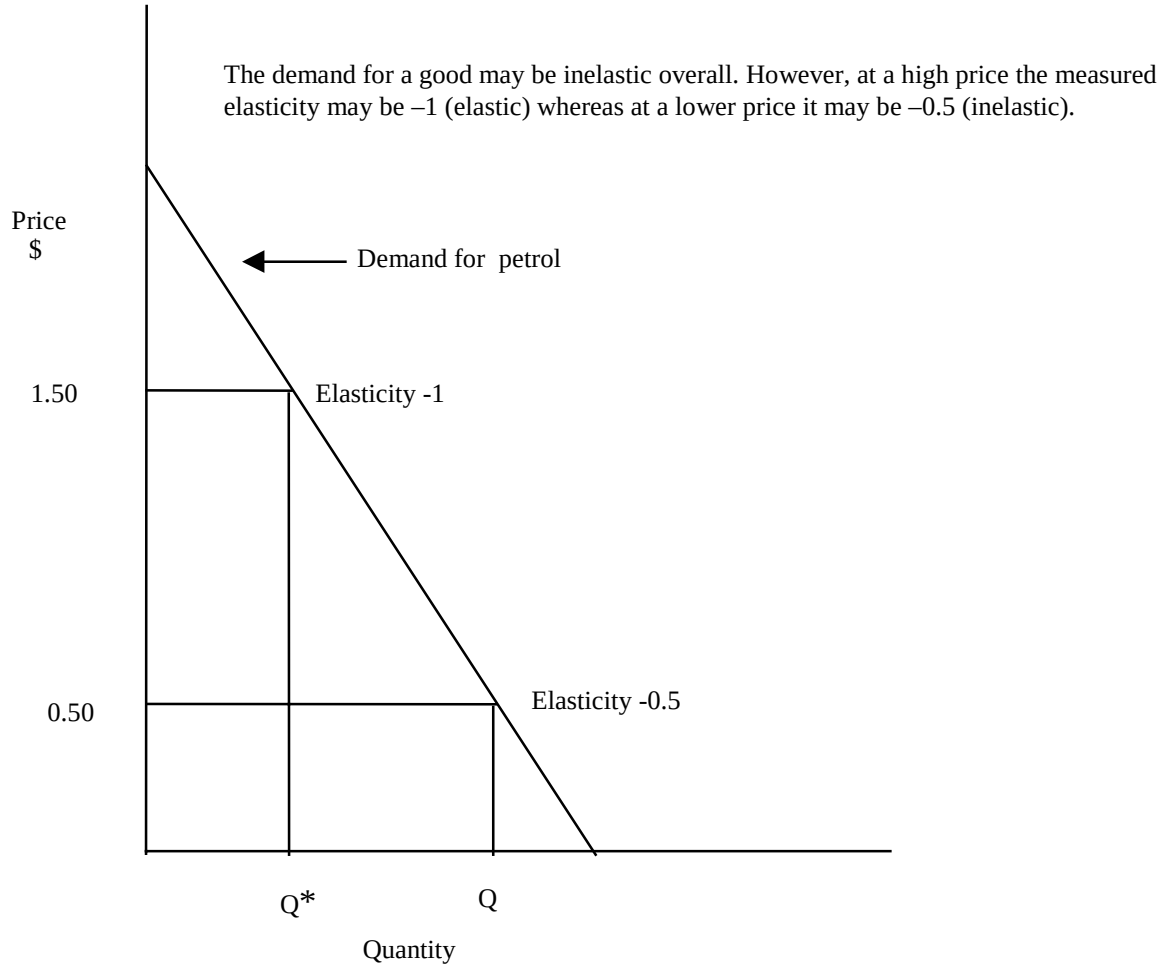
- As discussed in chapter two, unlike normal consumer goods, the price of gambling is not readily apparent. To the extent that consumers do not know the price, it is reasonable to suggest that they will not be particularly responsive to price changes. It is particularly difficult to determine the price where there are infrequent or highly variable payouts. As Weinstein and Deitch (1974) contend 'gamblers will be more concerned about the odds and hence more responsive to tax/price changes, where there is a good chance of winning any particular bet'.
- Secondly, there appears to be only limited substitution of one gambling form for another by consumers. The less substitutable a good is, in general, the less price responsive it is.
    - As illustrated in figure 19.2 (in chapter 19) the introduction of gaming machines and casinos in a number of states drew more gamblers into the market, rather than drawing significant revenue from existing forms of gambling.
    - Gaming machines have a significantly lower payout ratio than most casino table games (ie a much higher price), yet gaming machines are still very popular within casinos, indicating a lack of substitution by these gamblers based on price.

In the discussion that follows it is important to recognise that the responsiveness of the demand for a gambling game overall, can be different to the responsiveness as measured at a particular tax rate. For instance, as shown in figure 1 the demand for petrol is inelastic over a large range of prices. Yet at a high price of $1.50 a litre,

demand may become elastic, as people eventually move to other forms of transport, or drive their cars less. In general, the higher the price, or tax rate, the more elastic demand for the good will become.

Figure D.1 **The higher the price the more price responsive demand for a product is likely to be**

Demand elasticity for petrol at a high and low price



(a) Lotteries

Lotteries — which are characterised by a low ticket cost combined with a very low chance of winning — are likely to be highly insensitive to price across a broad range of prices. For instance, Lyons and Ghezzi's time series study of lotteries in Oregon and Arizona found that 'reducing the odds was unrelated in either state to changes in betting, suggesting that people like low stakes and do not discriminate [between] different odds or changes in odds when the odds are small anyway (National Research Council 1999, p. 246). In fact, it is unlikely that lotteries could operate at their current levels in the presence of such high tax rates (82 per cent of expenditure,

or 455 per cent if expressed in pre-tax prices) if their demand was not unresponsive to price/odds. The taxation of lotteries in Australia is not unique; lotteries in other countries also tend to be highly taxed. Moreover they are often have lower payout ratios than in Australia, further suggesting inelastic demand.[1]

Indeed, because the demand for lotteries seems to be insensitive to tax rates, governments tend to treat them as a form of voluntary taxation, and they are often accepted as such by the public (especially if the proceeds are used to fund major projects or good causes).

However, the perception that the demand for lotteries is insensitive to price, contrasts with the findings of some econometric studies. For instance, Clotfelter and Cook (1990), and Farrel and Walker (1999) find that the demand for lotteries and lotto products is highly elastic. Access Economics (1998) find the demand is highly elastic for 'high-turnover' Tattslotto. On the other hand, Access find that the demand is highly inelastic for Ozlotto and Powerball and 'high-turnover' Tattslotto. BERL (1997) in New Zealand found that lotteries were only slightly elastic (table D.1).

Table D.1 **Studies appear to show that demand for lotteries is price sensitive**

(less than -1 is elastic, greater than -1 is inelastic)

Study and product	*Elasticity*
Farrel and Walker, UK 1999	-1.55 to -2.6
Access Economics, Aust 1998	
Tattslotto – low turnover	-2.19
Tattslotto – high turnover	-0.24
Ozlotto - low turnover	-0.2
Ozlotto – high turnover	-0.8
Powerball – low turnover	-0.03
Powerball – high turnover	-0.02
BERL, NZ 1997	
Lotto and Instant Kiwi	-1.054
Clotfelter and Cook, US 1990	
Lotto	-2.55
Numbers game	-3.05

Source: Tattersall's, sub. 156, p. 53; other references as in the table.

[1] Australian lotteries typically have payouts of 60 per cent of revenue. US lotteries have an average payout of 51 per cent of revenue (Clotfelter and Cook 1990). The National UK lottery pays out 45 per cent of revenue (Farrel and Walker 1999). The NZ lottery pays out 55 per cent. In price terms (one minus the payout) these differences are significant.

There are a number possible explanations for the apparent difference between some of the econometric findings and the more qualitative assessment that demand for lotteries is insensitive to their price:

- As mentioned above, a finding that demand for lotteries is sensitive at high prices — owing to current levels of taxes — does not mean demand is necessarily sensitive at lower prices and tax rates. In fact, faced with an inelastic demand curve, to maximise profits, a producer will continue to raise prices until eventually demand becomes elastic. Elasticity increases because at high prices substitutes may emerge that are not viable at lower prices (see IC 1994 for further details).
  - With the exception of the Access study, the estimates are based on overseas lotteries, which have lower payout ratios — often significantly lower — than lotteries in Australia. Lower payout ratios are equivalent to higher prices. So as illustrated in the diagram (figure D.1), the studies are based on a price that is further up the demand curve (where we would *expect* demand to be more elastic) than Australian lotteries.
- A number of the studies are based on the demand for particular lottery products. Such demand would be expected to be considerably more sensitive than for lottery products as a whole. For instance, the demand for beer is insensitive to price. However, if one beer brand attempted to put up prices, even slightly, relative to other brands, demand would be expected to fall significantly.
- Most quantitative studies estimate the responsiveness of demand to price using consumers' reaction to occasional big payouts, or 'super draws', that are announced in advance and accompanied by advertising campaigns. It is uncertain whether consumer reaction to these occasional events is a good guide to how the demand for lotteries would change if tax reductions increased payouts on a permanent basis. For instance, just as the consumer response to clothing sales is not be a good guide to the elasticity of demand for clothing overall, the response to lottery special draws is similarly not likely to be a good guide to the elasticity of lottery products.

Access Economics (1998) suggests that, on the basis of their empirical work, the demand for Tattslotto is so sensitive that reducing the tax rate would lead to such an expansion in expenditure that tax revenue would actually increase. That is not inconsistent, however, with the demand for lotteries being sensitive at very high tax levels but insensitive at lower levels. In fact, the study supports this proposition. It suggests that if taxes were reduced from 35.5 to 20.8 per cent *of turnover* (equivalent to a reduction from 88 to 52 per cent of expenditure) the deadweight losses could be largely eliminated. If deadweight losses were very low at a tax rate

of 50 per cent — still a higher tax than on other gambling products — this would suggest that demand was quite inelastic up to that price.[2]

Even so, the Access result must be interpreted with caution. The same study estimates that Powerball and Ozlotto have very inelastic demand, with the implication that taxes could be raised on these goods without much increase in the excess burden. It is difficult to see how virtually identical and highly substitutable products could exhibit such widely differing elasticities of demand — a puzzle acknowledged by Access.

Thus, in the Commission's judgment, while the available studies are useful and raise some questions, they do not undermine the presumption that the demand for lotteries is generally insensitive to price, across a wide range of prices. If the pattern of demand for lotteries is similar in different countries, the lower payout ratios (higher prices) of most overseas lotteries suggest that taxes in Australia may not have pushed the price of lotteries close to the elastic part of the demand curve.

(b) Gaming Machines

Although the price of gaming machines is also very difficult to observe, they provide more feedback to the consumer on total returns than lotteries — the game is played repeatedly, and consumers will have some idea of the rate at which they lose. This in itself may mean that the demand for gaming machines is more price sensitive than that for lotteries. Lower tax rates for gaming machines may mean this view is shared by state revenue authorities. The fact that operators offer payouts above the minimum may also indicate a greater degree of price sensitivity than lotteries, although this is also likely to reflect competition among operators — like the beer brand example — rather than price sensitivity for gaming machines overall.

In New Zealand, BERL (1997) estimated the elasticity of demand for gaming machines and casinos to be -0.8 (somewhat unresponsive to price). While this estimate is subject to the same caveats applying to other econometric studies, anecdotal evidence tends to suggest that demand for gaming machines may be somewhat unresponsive to price, albeit less so than for lotteries.

[2] In theory, if gambling operators have superior knowledge about demand, and are willing to *guarantee* governments increased tax revenue (through agreeing to pay a specific amount of tax), there is a reasonable argument on efficiency grounds for allowing them to increase payout rates (thereby reducing the implicit level of tax on net expenditure). But this is properly a matter for negotiation between the gambling operator and relevant state government. And if demand for lotteries is price sensitive, the equity implications of any reductions (and associated revenue increases) should be considered.

- Firstly, there has been extraordinary growth in revenue from gaming machine since they were legalised in a number of states in the 1990s. While this growth is driven by the greater accessibility of gaming machines, it also provides no support for the view that high tax rates are significantly reducing the level of gaming machine play. Demand also appears to have grown strongly in New South Wales in recent years where they have been legal for many years;
- Secondly, people on low incomes tend to gamble a greater proportion of their income on gaming machines than people on high incomes. The sacrifices, in terms of other goods forgone, that low income earners are willing to make to gamble on gaming machines shows they place a high value on being able to gamble in this way. In turn, this may indicate that their demand is relatively unresponsive to price.
- Finally, payout ratios on gaming machines often vary between clubs and hotels. For instance in New South Wales, clubs retained 9.4 per cent of turnover, whereas hotels retained 10.5 per cent of turnover. Thus, the payouts from hotels were about 10 per cent less than for clubs. Lower payouts by hotels appear to be sustainable behaviour, which — allowing for differences in the venues and their clienteles — could also indicate that gamblers are insensitive to relatively small changes in payout rates.[3]

(c) Casinos

There are no studies solely on the sensitivity of the demand for casino gaming. It is likely, however, that some types of gamblers in casinos are more sensitive to prices than others. 'High rollers', who are able to gamble anywhere in the world, are acknowledged to be highly responsive to price, and for this reason are offered commissions to gamble at particular casinos. Since prices are more easily observable for some table games than other gambling forms, the sensitivity of demand for casino gaming is likely to be significantly greater than for lotteries. In practical terms, it may not be possible to tax casinos at the same rate as lotteries (and possibly gaming machines), without changing the rules of table games (such as roulette and blackjack) which have significantly higher payout ratios than gaming machines or lotteries.

[3] Within the *one location* there is contradictory evidence about the sensitivity of demand to price. Many people play 2 cent machines at a high level of intensity, betting up to $1.00 at a time. Yet the payouts on these machines are less than payouts on the $1.00 machines which may indicate players are insensitive to price. On the other hand gaming machine operators have told the inquiry that gamblers tend to gravitate to machines that they perceive offer the largest payouts.

(d) Racing

Like casinos, racing attracts different types of gamblers who could also be expected to display different levels of sensitivity of demand to price. Traditional racing punters, who follow 'form', are not likely to substitute racing for other forms of gambling. However, there is also a category of 'recreational' gambler who treats racing in much the same way as gaming — particularly since racing and gaming opportunities are increasingly located in the same venue. This group may substitute one form for another depending on price changes. If any form of gambling has suffered from the introduction of gaming machines and casinos, it is most likely to be racing, although other factors may be behind the slight decline in racing expenditures.

BERL (1997) estimated the elasticity of demand for race betting at -0.7 in New Zealand — somewhat unresponsive to price.