APPLYING ENVIRONMENTAL PRODUCT TAXES AND LEVIES – LESSONS FROM THE EXPERIENCE WITH THE IRISH PLASTIC BAG LEVY

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ABSTRACT

There have been occasional ad hoc efforts to influence consumer behaviour by the imposition of product taxes that in some sense reflect the external costs imposed by such products that are not included in the price of the product itself. In the spirit of this idea, in 2002 Ireland introduced a 15 Euro cent tax on plastic bags. Anecdotal evidence indicates that it has had a dramatic effect on the use of same in retail outlets – preliminary estimates indicate that the reduction in use is of the order of 90 per cent. This paper will analyse this policy initiative from the perspective of economic efficiency, environmental effectiveness, and equity, and provide some general guidelines and insights for other jurisdictions planning similar proposals.


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Introduction
In March 2002, the Irish government introduced a levy\(^1\) of €0.15 (over 30 Australian cents) per plastic bag – with some exceptions noted later - provided to shoppers at point of sale in retail outlets. In this paper we summarise the theoretical framework that informs this idea, and how this levy works in practise. We then examine its net costs and environmental effectiveness, and end with some lessons from the Irish experience.

Theoretical Framework
Pigou (1960) made the now familiar case for environmental taxation. If pollution is imposing costs on society that are not borne by the perpetrator, these external costs should be internalised by imposing a tax on the pollutant in question. And this tax should be set at the level which reduces emissions to the point were the marginal benefits of internalisation just equal the marginal costs of abatement, i.e. at the point where the ascending marginal cost curve transects the descending marginal benefit curve. To clean up beyond this point would add more in costs that would be added in benefits; to do less would leave opportunities where net benefits could be yielded by increasing abatement.

And this use of a market signal had some very attractive features, especially when compared with a strict definition of command and control as the alternative, where the authority decided how much and under what circumstances each emitter could pollute. The tax would achieve the optimum at minimum cost; polluters for whom it was very expensive to abate would continue to pollute and pay the tax, while those for whom it was inexpensive to clean up would do so, and the net result would be the achievement of a given level of abatement at least cost, i.e. what economists call static economic efficiency would be achieved. And such a tax would also stimulate innovation, since a new technology that would reduce emissions would also reduce the tax bill; there was a constant incentive to innovate, such that what economists call dynamic efficiency would result. And the system would be fair, because ‘the polluter pays’; either as the producer of the product in question, or the consumer through higher prices or a combination, depending on the competitiveness of the sector in question. And administrative costs would be low, because only the emissions needed to be monitored. A further benefit of the Pigovian tax is yielded when the revenues are re-cycled to reduce other ‘distorting’ taxes, e.g. on labour; such wider economic benefits are called the ‘double dividend’. (Goulder, Parry and Burtraw, 1997).

There is now a wide range of documented applications of environmental taxes, which have been assessed in terms of their economic efficiency and environmental effectiveness (see for example Barde, 1997, OECD, 1993, 1996, 1997, 2001, Stavins, 2000, European Environment Agency 1996, European Commission 1997). There is also a literature on the equity and competitiveness effects of such taxation; see for example Barker and Kohler, 1998, Baron, 1997 and Ekins and Speck, 1999, Jaffe et al, 1995, and Krugman, 1994.Both the theory and practise focus on emissions and their internalisation. There is a very sparse literature focused on those goods and services where the costs of measuring, monitoring and charging for emissions are so high that it is a practical impossibility, and the second best option of taxing the good itself, with its ‘embedded’ external costs, is the focus of attention. Perhaps the best example of such taxes are those that are applied to energy, notably transport fuels, where an excise duty per litre of fuel purchased is assessed, as a proxy for the external costs they impose when consumed. This obviates the problem of trying to measure and charge for the particulates, NOx, hydrocarbons, greenhouse gasses etc. that are emitted by the consumer, but at the cost of only very crudely approximating such external costs. In this paper, we address this type of second best world, where a product tax on plastic bags is imposed to internalise the external costs. These external costs are incurred because of ‘too many’ plastic bags in the Irish environment.

\(^1\) ‘Levy’ is the official term used. In this paper, we use the words ‘tax’ and ‘levy’ to mean the same thing.
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The tax under review is not a Pigovian tax in the sense that it is not overtly set at a level that internalises costs up the Pigovian optimum. Nor are the revenues recycled to reduce other taxes in the economy. Because it is imposed at retail level on Irish shoppers, there is no real competitiveness issue. The Republic of Ireland shares a land border with Northern Ireland, where there is no levy, but the costs are such a minor proportion of the total shopping bill that there is unlikely to be any ‘leakage’ of shoppers across the border caused by the levy.

The External Costs of Plastic Bags

There has been no study that we are aware of that estimates the total or marginal external costs of plastic bags ‘released’ to the environment, and the issue is not a priority for environmental scientists or organisations like the Irish Environmental Protection Agency that are charged with protection of the Irish environment. However, anecdotal evidence indicates that for many of the public it is seen as an issue. Two aspects of the local scene in Ireland seem to be germane. First, Ireland is a country of frequent and often high winds, and bags released on the street or elsewhere can quickly travel a distance. Second, Ireland is a country of hedgerows, with relatively small fields enclosed by shrubs, hedges, clumps of trees and ditches, and these are manifest along every roadside. The effect of the combination of wind, hedgerows and fecklessness on the part of many of the public as regards their disposal of such bags means that the hedges and trees of the country side are randomly adorned with plastic bags in various states of disintegration, a landscape feature which becomes particularly evident in the winter, when the masking effect of deciduous vegetation is absent. The rural landscape in Ireland is valued by the locals, but is also an important dimension of the tourist industry. And its protection is all the more important because the built environment in many parts lacks distinction. As regards the latter, the eminent architectural historian Maurice Craig (1982) opined:

‘There are, it is true, a few categories of building which are peculiar to Ireland: such are, for example, Round Towers, spirit-groceries and ball-alleys……The somewhat melancholy but undeniably appealing beauty of large tracts of the West is matched only by the ingenuity of garage proprietors and hoteliers in enlivening the foreground with irrelevant banalities. Yet in time the eye can train itself to disregard what is actually to be seen, and to dwell only on what is worth seeing.’

Thus, while the aesthetic effects of plastic bags adorning the countryside is no doubt much appreciated by a minority, for most it is a negative experience. In addition, the usual ‘feel good’ benefits associated with re-use and recycling are likely to be germane, as are the reduction in negative biological effects of long lived plastic on flora and fauna, especially where the bags get into canals, rivers, and the sea.

The policy under review then is a political response to these negative perceptions on the part of the public.

How it works

A Little History

The possibility of an Irish plastic bag levy was discussed initially in 1994. In 1996 framework legislation (Waste Management Act 1996) was enacted in which inter alia government was empowered to impose environmental levies on retailers and others. The then Opposition spokesperson for Environment was Noel Dempsey. In 1997 a General Election was called, and the largest political party – then in opposition - Fianna Fáil, promised in its election manifesto to introduce such a levy if elected to government, and subsequently Mr. Dempsey became Minister for Environment and Local Government. A consultancy report was commissioned to explore the options. The consultants reported in 1999, with a

2 There is however a large disparity in petrol and diesel prices between the two jurisdictions, because of much higher excise duties applied in the UK, and this does result in considerable leakage of consumption from Northern Ireland to the Republic.
recommendation that an upstream levy (on producers and importers) of approximately €0.035 per bag be imposed. But Mr. Dempsey wanted a strong signal to be given directly to consumers, including having the choice of paying the levy and getting a bag; he insisted on a downstream charge on consumers.

In March 2000, the proposal was agreed by the cabinet. It was decided that the provisions of the Waste Management Act (1996) were not strong enough to support such a levy and that an amendment to that Act would be required, which was duly provided in the Waste Management Amendment Act, 2001.

Industry initially proposed a voluntary take back scheme, but once it was clear that government was determined to proceed, the lobbying focus turned to implementation. The main concern of retailers was that they would be blamed for ‘profiteering’; the solution was a strong publicity campaign by the Department, which succeeded in conveying the reasons why the levy was being introduced. Butchers were particularly opposed to a levy that would apply to all plastic bags, on the basis that various purchases meat needed to be wrapped separately for hygiene and avoidance of cross contamination reasons, and should be exempt, a point which was supported by the National Food Safety Authority, and some supermarket chains. This case was accepted, and in effect exemption was given to plastic bags below a certain size when used for specific purposes. There was extensive consultation with the main industry representative body – the Irish Business and Employers Confederation (IBEC) – and the leading retailers, notably grocery stores, in the design and implementation of the scheme.

Securing support from the Minister for Finance, and the Revenue Commissioners was crucial to the successful implementation of the levy. To this end, Mr. Dempsey met with the then chairman of the Revenue Commissioners and also sold the idea to the Minister for Finance.

The Amount

The levy was fixed at €0.15 (over 0.30 Aus $) per bag; on the basis that it would be sufficiently high to give most consumers pause for thought, and stimulate them to avoid paying by bringing their own ‘permanent’ reusable shopping bags with them. There was no attempt to identify the marginal external costs and determine the optimum level of tax. Current projections estimate that the revenue in a full year will total approximately €10-11 million. The Environment Fund will also include an estimated €28 million raised annually from the associated Landfill Levy, i.e. an estimated total of €38 million annually will be available.

Operation and Enforcement

Every quarter, retailers send a direct debit payment slip to the Collector-General division of the Revenue Commissioners in Limerick. On a monthly basis, this revenue is transferred into the Environment Fund (controlled by the Minister for the Environment, Heritage and Local Government). Once a year, the money owing to the Revenue Commissioners is paid over for the administration of the levy (see below), as set out by the inter-agency agreement between the two organisations.

The Department of Environment, Heritage and Local Government and the Revenue Commissioners agreed that an initial set up cost of €1.2 million be provided to the latter. This was earmarked for new computer systems and for the need for increased resources generally to administer the levy. It has also been agreed that the Revenue Commissioners will receive €300,000 per annum (dependent on future collections and costs) to cover ongoing costs. The Department also spent some €358,000 on an advertising campaign to launch the levy.

Enforcement is a responsibility of the local authorities and the Revenue Commissioners. (The local authorities role is confined to enforcing the actual charging of the levy to the end customer). This has proved to be relatively easy, as the public have ‘bought in’ to the scheme,
and report delinquent retail outlets. The major UK department stores were initially reluctant to implement, because their centrally controlled and defined accounting systems did not provide for such a tax. However, after some delay, they are now fully compliant.

Using the Funds

The revenues are ring fenced in the Environment Fund, to be used for a variety of purposes, including: defraying the costs of administration; support and promote any programmes established for the prevention or reduction of waste and research and development in the waste area; assist, support and promote the production, distribution or sale of products that are seen as less environmentally harmful than other products falling within the same class; aid producers in initiatives designed to prevent or reduce waste arising from activities carried out by them; assist in the enforcement of any enactment related to waste management or the prevention of litter or protection of the environment in general; facilitate partnership projects that involve local authorities with the purpose of improving the environment in a particular area; promote environmental awareness, and education and training that assist provision of necessary resources for the aforesaid education and training; aid local and environmental groups in promoting initiatives that aid the protection of any aspect of the environment.

Performance

What has been the effect of the levy, and the costs and benefits to retailers, plastic bag producers, and consumers? We did face to face interviews with leaders in the retail sector, following the completion by them of detailed questionnaires. Those interviewed account for about 50 per cent of retail sales, and represent a cross section of outlets as regards nature and scale, and so we believe our findings are representative. As regards consumers, we took a randomly selected sample of 100 householders, and conducted a telephone interview with them. While the sample size is small, the answers were very consistent, and we feel that they are indeed representative, but we acknowledge that a larger sample would be needed to provide statistical robustness to these findings. As regards the plastics industry we base our findings on a survey conducted by the Department of Environment, Heritage and Local Government.
Retail Survey

The findings can be summarised as follows:

**Table 1. Survey of Retailers January – March 2003 – Key Findings**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>Supermarket multiple</td>
<td>Supermarket multiple</td>
<td>Symbol Group grocery</td>
<td>Symbol Group grocery</td>
<td>Independent</td>
<td>Department/clothes store</td>
<td>Department/Clothes store</td>
</tr>
<tr>
<td>No. of Outlets</td>
<td>80</td>
<td>&lt;20</td>
<td>200+</td>
<td>400</td>
<td>5</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Market share (%)</td>
<td>20-30</td>
<td>0-10</td>
<td>0-10</td>
<td>0-10</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Turnover (2002 Million €)</td>
<td>1400</td>
<td>750</td>
<td>36</td>
<td>208</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plastic Bag use before levy per annum (million)</td>
<td>220</td>
<td>60</td>
<td>72</td>
<td>7.5</td>
<td>3.108</td>
<td>.40</td>
<td></td>
</tr>
<tr>
<td>Expenditure on bags per annum before levy Million €</td>
<td>2.196</td>
<td>0.5+</td>
<td>1.27</td>
<td>0.9</td>
<td>0.082</td>
<td>0.154</td>
<td></td>
</tr>
<tr>
<td>Bag Storage costs €</td>
<td>12,000</td>
<td>Negligible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction in bag use post levy (%)</td>
<td>95</td>
<td>90-95</td>
<td>99</td>
<td>89</td>
<td>89</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>Consultation (no of meetings)</td>
<td>23</td>
<td>Did not attend</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre introduction survey of consumers (% favourable)</td>
<td>72</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Overall impact positive (+3), neutral (0) or negative (-3)</td>
<td>Neutral (0)</td>
<td>+3</td>
<td>0</td>
<td>+2</td>
<td>+2-3</td>
<td>-1</td>
<td>0 to -1</td>
</tr>
<tr>
<td>Implementation costs annually (€)</td>
<td>100,000</td>
<td>15,000 start up and 2,000 per quarter on going</td>
<td>0</td>
<td>60,000</td>
<td>Negligible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoplifting and Trolley theft increase annually €</td>
<td>65,000</td>
<td>Rose initially then fell. 10,000 per quarter for shoplifting and 15,000 per quarter initially</td>
<td>Rose initially then fell</td>
<td>No increase</td>
<td>Negligible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in alternative demand for bags (bin liners etc.) - %</td>
<td>75</td>
<td>Small increase</td>
<td></td>
<td>Very large increase</td>
<td>400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The bottom line is that retailers find the effects on their well being neutral or positive, with the additional costs of implementation—book-keeping integrated with VAT returns—being modest, and generally less than the savings resulting from not having to purchase bags. Retailer B was so pleased with the take up of its long life exempt bags which reduced its costs of providing plastic bags that it advertised in its stores that it was absorbing the 1% VAT increase which was introduced last year because of its significant savings on plastic bags.)

Shoplifting rose initially, but then returned to pre-levy levels.
Householders

Overall, householders were very much in favour of the levy. The household survey indicated that a majority felt that the impact of the levy in terms of convenience at checkouts and generally was enhanced, but that the levy had added to their expense. This latter finding is an inevitable product of the fact that householders either have to pay the levy or buy long-lived bags. Virtually all respondents indicated that the impact on the environment was positive, producing a noticeable reduction in plastic bags 'in the environment'. There was no discernible variation in these responses related to socio-economic status or degree of environmental awareness.

Table 2. Survey of Householders, March 2003

<table>
<thead>
<tr>
<th>% of total surveyed</th>
<th>Impact at checkout</th>
<th>Convenience</th>
<th>Expense</th>
<th>Environmental Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>27</td>
<td>31</td>
<td>14</td>
<td>90</td>
</tr>
<tr>
<td>Neutral</td>
<td>60</td>
<td>45</td>
<td>60</td>
<td>8</td>
</tr>
<tr>
<td>Negative</td>
<td>13</td>
<td>24</td>
<td>26</td>
<td>2</td>
</tr>
</tbody>
</table>

Plastics bag manufacturers

At the time the levy was introduced, there were 4 plastic manufacturing firms operating in the Republic. One of these – which concentrated on the high quality end of the market - with an annual turnover of €2.54 million and employing 26, has since gone out of business. There is uncertainty as to whether this would have happened even in the absence of the levy.

Conclusions and Lessons

The research work is continuing, with more retailers and householders being interviewed. While this will provide further nuances, it is unlikely to change the broad conclusions, which are as follows:

- The costs to government are modest. One off set up and annual administering costs incurred by the Revenue Commissioners amount to €1.2 million and €350,000 (dependent on future collections and costs) respectively. Advertising costs arising from the publicity campaign to launch the levy amounted to €358,000.

- For retail firms, the revenue collection and reporting is readily easily integrated with their VAT collection systems, so net additional costs are modest, and more than counterbalanced by costs savings in terms of plastic bag purchase foregone and additional sales of bag liners.

- There is a large reduction in plastic bag use, amounting to in the order of 90 per cent. There is a strong perception amongst all householders surveyed that this translates into less plastic bags in the environment, but no field survey has been done to validate or otherwise this perception.

- The commitment of a Minister at Cabinet level was crucial in ensuring that the various arms of government collaborated, so that the proposal went from concept to successful execution. Without Mr. Dempsey’s enthusiastic and effective support, it would not have happened, and it is likely that the voluntary scheme initially preferred by industry would have been selected.
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- Extensive consultation with stakeholders ensured that a key requirement from their point of view – allowing use of smaller bags to separate fresh food for hygiene purposes – was permitted. Some smaller operators feel that consultation was biased in favour of the ‘big boys’ and the grocery trade.

- Edmund Burke observed that ‘To tax and to please, no more than to love and be wise, is not given to men.’ The extent of support by the public shows that this is not always true. When people are faced with a choice where they can readily respond at relatively low cost to achieve a socially desirable end, they adapt quickly and in many cases enthusiastically. Many report feeling guilty when they forget to bring their own long life bag and have to pay the levy.

- A robust legislative and regulatory base is necessary. Italy introduced a plastics tax in 1994, but it was challenged in court, and was eventually withdrawn in 1997.

- Is the tax dynamically and statically efficient? It is certainly likely to be more statically efficient than an absolute ban, as it allows those for whom a plastic bag is important to pay the tax rather than do without. There is no evidence yet of innovation being induced, but the Environment Fund can be used to finance R&D, so there may be some innovation in the future.

- There may be some losses in the plastics industry. Their extent will depend on whether and to what extent there are strong alternative investment and employment opportunities available.

- Is it fair? Because the net costs to both business and consumers are negative or very low, there is unlikely to be negative distributional effects. There is no evidence from the household survey that even those who are unemployed feel that it is ‘unfair.’

- Is it too successful, in the sense of internalising costs beyond the Pigovian optimum? We don’t know the answer to this question, because, while we have some idea of the costs of internalisation, we don’t know the value of the ensuing benefits. Note however that a key objective of the Minister was to heighten public awareness of the environment in general. It seems to have achieved this objective at very low net cost.
References


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