The Irish Plastic Bag Levy – A Review of its Performance 5 years on.

“It was sad to see the empty bag
Blown about like a dirty rag”
A Summer Morning Walk
By Patrick Kavanagh
(1904-1967)

Introduction:
In March 2002, the Irish Government introduced a 15 Euro cent environmental levy on all shopping plastic bags, previously provided free of charge to consumers at points of sale. The motivation for such was primarily to reduce the consumption of plastic bags and the resulting downstream litter effects on the Irish landscape. The impact was immediate and dramatic. Research by these authors estimated a reduction in the consumption of plastic shopping bags in excess of 90%. Associated gains in the form of reduced littering and negative landscape effects were also recorded. The levy has collected in excess of €85 million and administration of the levy was simple with associated costs amounting to approximately 3 per cent of revenues. Despite some initial hostility to the proposal in some quarters, acceptance by stakeholders has also been widespread. The fact that such a product tax has influenced consumer behaviour in such a dramatic way has heightened interest in its use amongst policymakers both in Ireland and elsewhere. Similar levies have been proposed in jurisdictions as diverse as Scotland and Australia. Policymakers in Ireland have proposed follow-on environmental charges on products ranging from Automatic Teller Machine (ATM) paper receipts and chewing gum.

Despite all this, the longer term performance of product taxes such as the plastic bag levy remains a very under-researched area. In Ireland, the levy tax receipts (and therefore usage of plastic bags) have increased significantly (however, usage is still well down on pre-levy levels) over the last number of years. This fact, along with some anecdotal evidence indicating a slippage in the performance of the levy has led to the Irish Government increasing the levy from 15 to 22 Euro cents per bag at point of sale. While
it is still too early to investigate the impact that this increase has had on consumption of plastic bags, we do attempt to review the performance of the levy over the last five years while also offering some preliminary analysis on the impact of the increase in the levy. In addition, despite its perceived success, similar policy initiatives have been slow to emerge in other jurisdictions, therefore we also identify and analyse some of the barriers to wider implementation of such policies.

The paper is organised as follows: in the next section we briefly return to outline the motivation for the levy and focusing on product taxation as a policy tool and outlining the implementation processes involved in this case. Following this, given its impressive initial performance, we also investigate the interest shown by policymakers in Ireland to extend it to other products and also refer to policy interest and interventions elsewhere. In the following section, we take a more detailed look at the levy performance both in terms of revenues raised (which can tell us roughly how many bags were consumed) and also look at some downstream environmental performance indicators. In this context, we discuss the reasons given by the Irish government for increasing the levy from €0.15 to €0.22 and explore how the hypothecated revenues have been deployed. Finally, we discuss some of the administrative hurdles involved in the levy process that may have hindered similar policy initiatives elsewhere as part of the conclusions to this paper.

2. The Plastic Bag Levy – Initial Motivations and Performance:

2.1 Motivation for the Plastic Bag Levy and Early Performance:
Previous research (Convery et al., 2007) investigated how the implementation of a product tax, inspired by a desire to reduce consumption of a specific product impacted consumption patterns related to that good. In addition, it investigated the downstream effect by exploring how the change in consumption patterns impacted on the number of bags entering the waste stream. This research found that the number of bags entering the consumption stream initially fell by approximately 94%. Preliminary analysis on the downstream impact through the use of a number of litter indicators also showed a dramatic decrease in the presence and visibility of plastic bags. In this paper, we return to the topic of this levy with five years of experience behind it. In the following paragraphs
we briefly introduce the motivations for the levy, the nature of product taxation in general and the initial results.

Before the implementation of the levy, plastic bags constituted a small proportion of total waste generated by Irish households each year (by weight) and plastic bags were not the most numerous item of the national litter composition (constituting some 5% of the share, The Litter Monitoring Body, 2003). Given this, it might seem strange that such focus was placed upon plastic bags by policymakers. However, the main motivating factor for addressing plastic bag consumption and ultimately litter was their visibility. The long life characteristics of these bags, combined with the landscape and climate of Ireland, ensured that plastic bag litter was the most visible and persistent component of litter pollution throughout the countryside and along coastlines.¹

While a ban on littering in general would be a more direct instrument for addressing this problem (of course, such legislation exists, see Convery et al., 2007), legislators opted for an additional levy on plastic bags at point of sale. Such a levy directly targets the consumption of plastic bags through the use of a fiscal signal with the aim of reducing consumption. The resulting reduction in the number of bags entering the waste stream is intended to indirectly address the differential impact (in relation to plastic bag durability and visibility) compared to other litter items. Thus, such measures are intended not only to directly change consumer behaviour in a more sustainable manner but to indirectly address the specific characteristics of the product which makes it so visible.

Environmental taxation is not a new idea and applications have been widespread since Pigou (1960) first made the case for employing environmental taxes. Such taxes are intended to internalise the external costs of pollution through imposing a levy on the pollutant at a price level which reduces emissions to the point where the marginal benefits of internalisation just equal the marginal costs of abatement. The literature in this area covers a vast array of topics and economists generally prefer the use of market-based

¹ Department of the Environment, Heritage and Local Government Press release 20/12/2001: www.environ.ie/DOEI/doepub.nsf
instruments (such as environmental charges) over command and control approaches. Such advantages arise from the static and dynamic efficiencies present in market-based instruments; see for example Baumol and Oates (1988) or Sterner (2003). There is also scope for taxation to deliver what is termed a “double dividend” as revenues raised through taxes on environmental “bads” are recycled to reduce taxes on economic “goods” e.g. on labour; see Goulder (1995), Goulder et al. (1997). In addition, taxation applications can offer advantages over other instruments in terms of equity and competitiveness (Barker and Kohler 1998; Ekins and Speck 1999; Jaffe et al. 1995).

Having decided to tackle the problem of plastic bag litter visibility with an environmental tax, the Irish government faced choices in two areas; firstly would the tax be upstream (imposed on producers and/or importers) or downstream (imposed at the point of sale) and secondly, at what level to set the levy. An initial consultancy report recommended an upstream levy set at a modest level (under the equivalent of €0.05 per bag) based primarily on administrative ease (Fehily et al., 1999). However, both proposals were rejected by the lead government department – the Department of Environment, Heritage and Local Government (DEHLG). The rationale for this was related to the desire to change consumer behaviour (for more see Convery et al., 2007). The levy amount was first chosen at 10 Irish pence (€0.127) but was increased and rounded as a result of the introduction of the Euro around the same time. The initial operational levy, set at €0.15 per bag, was well above what was the expected maximum willingness to pay for bags (indeed, Drury et al., 2000 estimated an average maximum willingness to pay approximately one sixth of the eventual levy level).

At an operational level, Convery et al. (2007) showed that interaction with stakeholders (retailers, producers, importers and various trade groups) was extensive and continuous. However, it was made clear to each of the stakeholders involved that a levy was going to be introduced and the consultation process was aimed at facilitating a smooth introduction. Initial opposition to any levy quickly gave way to a level of acceptance.
2.2 The Plastic Bag Levy as a Product Tax:

The DEHLG was consistent in its desire to implement a product tax. In addition the aim of the levy was that would encourage a significant change in consumer behaviour. However, the arrival at the figure of €0.15 was rather ad hoc in nature as there was no attempt to calculate the marginal external costs associated with plastic bags in the environment. In this regard, the levy can not be described as a product tax adhering to pigouvian principles. Despite this, the levy is an addition to the wide array of environmental taxes employed in Europe. However, academic research has tended to focus on taxes concerned with energy, air and water pollution and waste (for more see: www.economicinstruments.com, OECD 2001; Stavins 2001; Sterner 2003). Product taxes are subject to less academic attention.

Generally, a product tax can refer to a tax imposed on units of a harmful substance contained within a product or on the product itself if the aim is to reduce consumption of that product generally (OECD 1996). Most research focus in this area is on the former type of product tax (i.e. the carbon content in a specific fossil fuel). However, while we are investigating the impact of a product tax on consumer behaviour, literature related to environmental taxation applications in the waste area typically focus on producer-generated pollution. This is often manifested as policies aimed at consumers attempting to reduce the volume of materials in the waste stream through deposit–refund systems, or user charges for waste collection (see e.g. Bohm 1981; Fullerton and Kinnaman 1996; Callan and Thomas 1999).

As noted, research into product taxes aimed at reducing consumption demand for a particular good remains a much less traversed area in the environmental taxation literature. This is in some contrast to the increase in policymaker interest in employing such taxes (partially fuelled by the perceived success of the Irish plastic bag levy) to alter consumption patterns for goods considered to have negative environmental impacts. Such applications of this instrument require the regulator to decide that the consumption of certain products have negative consequences for society in general. In this vein, authors such as Pearce and Turner (1992), who investigate the impact of a package tax in the UK
and Japan, recognise that the consumption of the good as a whole has a negative impact beyond the economic cost paid by consumers.

2.3 Initial Performance:
In terms of administrative costs, one-off establishment costs amounted to approximately €1.2 million and annual administration costs were in the region of €350,000. In addition to this, advertising costs associated with a publicity and awareness campaign were $358,000.\(^2\) In the first full year of operation (March 2002 to February 2003), revenues were approximately €12 million – this is equivalent to revenues approximately 30 times the costs of collection. Revenues in the second full year of operation were in the region of €14 million. At the time, this increase was put down to a settling down period in terms of consumer behaviour and increased compliance on behalf of retailers (for more, see Convery et al., 2007).

In terms of environmental performance, we have already alluded to the success in reducing plastic bag consumption. McDonnell (2003) estimated that consumption was reduced by 94% from pre-levy levels of approximately 1.2 billion bags. While estimating the reduction in bag consumption was reasonably straightforward, measuring the presence of plastic bags in the landscape was a more difficult task. In this regard, a series of litter surveys conducted by a consortium called Irish Business Against Litter (IBAL) and An Taisce (National Trust of Ireland) were investigated. The series of surveys conducted in urban areas throughout Ireland indicated that between January 2002 and April 2003, the number of “clear” areas (i.e. areas in which there is no evidence of plastic bag litter) increased by 21%. In addition, the number of areas without “traces” increased by 56% - a significant finding given the long life nature of the bags in questions.\(^3\) Data provided by the National Litter Pollution Monitoring System was also interrogated. In 2002, plastic bag litter accounted for 5% of national litter composition. After the

\(^2\) In addition, local authorities who are responsible for enforcing the levy are allowed to deduct up to 2% of revenues granted to them from the environmental fund. This is the fund that plastic bag levy funds are hypothecated along with funds from the associated landfill levy. For more see: http://www.environ.ie/en/Publications/Environment/Waste/WasteManagement/FileDownLoad,5059,en.pdf

\(^3\) Traces are defined as 5 or more items of the litter item over a linear distance of 1 metre.
introduction of the litter, the percentage fell to 0.32% in 2003 and 0.22% in 2004 (Litter Monitoring Body, 2004, 2005).

3. **Extending the Levy to other Products and International Interest:**

3.1 **Ireland:**

Together, these results indicate that, while the administrative burden involved in the implementation of the levy was not excessive, the impact on both the consumption of plastic bags and on the downstream litter composition were notable in the extreme. This, of course, led policymakers in Ireland to explore expanding the use of this policy tool while policymakers in other jurisdictions also took note.

In the former example, Irish policymakers have stated an interest in introducing levies on ATM receipts, on polystyrene food containers and on chewing gum, again as anti-litter measures. However, none of these cases has been acted upon. In the first instance, banks operating in Ireland used this policy intention as a way to restrict receipts being given out at ATM’s. Since June 2007, ATM’s no longer dispense receipts automatically. Instead, customers are asked do they want a printed receipt and reminded of their environmental obligations to dispose of the receipt carefully if they reply in the affirmative (IBF, 2007). In regard to the proposed levy on polystyrene containers for fast-food, the government has indicated that it will instead seek a phasing out of these containers. In relation to chewing gum, the Irish government announced its intention to introduce a levy but eventually agreed to suspend its implementation in favour of a voluntary agreement worth about EUR2 million a year for three years with the chewing gum industry. This occurred after representations made to it by, *inter alia*, the Wrigley chewing gum company (including by the US ambassador at the time). In recent times with a change in the make up of the Irish government coalition grouping, the topic has moved onto the agenda again.

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The above may indicate that while lobby groups impacted by the imposition of a levy on various products may now be better organised at opposing fiscal incentives, the department is still adept at extracting concessions (financial and otherwise) by using the threat of the imposition of a levy. This in itself is an interesting tool for policymakers for encouraging more sustainable behaviour from producers. The plastic bag levy was introduced in conjunction with a landfill levy and funds from both these were hypothecated into an Environment Fund (for more, see CAG, 2007; Convery et al., 2007). Despite numerous assertions that this policy tool would be extended to other areas, no other taxes have been introduced thus far. This raises some interesting questions about the uniqueness of the situation in regards to the plastic bags levy and its transferability to other products and jurisdictions. These are some questions we hope to address later in this paper. However, before we do that, we investigate how policymakers considering policy interventions in other jurisdictions viewed the Irish experience.

3.2 Interest in Other Jurisdictions:
Before the Irish intervention both Denmark and Italy introduced levies on plastic bags but in both cases, the taxes were ‘hidden’ in the tax was absorbed by the manufacturer, importer or retailer. Since the Irish tax has been introduced, it has been cited by many policymakers considering similar interventions throughout the world. However, as of yet, there has been no ‘copy-cat’ policy initiative. Command and control options have been in evidence in countries such as Nepal, Bangladesh, the Philippines, Taiwan and South Africa and in parts of India. These jurisdictions have introduced bans on the manufacture and distribution of plastic bags (for more see UNEP, 2005). Most recently, the city of San Francisco also banned plastic bags while the Greater London Authority is investigating a levy based on the Irish levy. Both Taiwan and South Africa banned plastic bags below a certain thickness and introduced a concurrent levy (such bags are easily ripped so more unlikely to be reused). While in the latter jurisdiction, manufacturers are not required to pass on the levy to consumers, retailers do pass it on in Taiwan. However, the level of the levy is set by the individual retailer and the revenues are kept by the retailer. Consumption of plastic bags has declined by approximately 80% since its introduction

In Rwanda, a stakeholder consultation process was developed with the task of eliminating plastic bag usage. In addition, like South Africa, a ban on plastics below a certain width was introduced (UNEP, 2005).

A number of other jurisdictions have also toyed with the idea of a levy. In the case of Australia, after an extensive consultation process, policymakers eventually decided to adopt a voluntary agreement approach with plastic manufacturers and retailers (The UK have adopted a similar strategy). Individual retailers such as IKEA introduced their own voluntary levies and saw large decreases in the range of the Irish experience (UNEP, 2005). However, as of now, no levy has been introduced. A similar consultation process has taken place in both Kenya and Scotland. In Kenya, a report from the United Nations Environmental Programme (UNEP, 2005) outlined the tableau of policy interventions available to Kenyan policymakers before advocating a 7 pronged strategy encompassing the banning of bags less than 30 microns in thickness (a common strategy in African countries as we have seen, maybe partially due to the large informal markets and difficulty in collecting taxes of this type), informational campaigns, an upstream levy and the development of aids for alternative bags, recycling systems and managed disposal systems.

In Scotland a bill was introduced to the Scottish parliament based almost entirely on the Irish model. However, the bill was eventually withdrawn in October 2006. This may be down to the better organised opposition from groups such the carrier bag consortium (representing plastics manufactures – www.carrierbagtax.com) and also better quantification of impacts on plastics importers and producers. The associated extended impact assessment investigated the impact of a levy of 10 pence on plastic and on paper bags in five areas: the environment, on consumers, on business, on local authorities and on waste (Cadman et al., 2005). The report hypothesizes a 90% reduction in plastic bag usage (akin to the Irish experience) with some slippage to paper bag usage in the absence of a levy on these types of bags. Consumer impact would be minimised by consumer switching away from plastic bags but they estimate a maximum detrimental impact of £10 per consumer per year. While the impact on food retailers would be positive,
negative impacts with accrue to non-food retailers and plastic bags manufacturers. In addition, in the absence of a levy on paper bags, the report indicates a marginal increase in waste due to the switch to these types of bags. In all cases, the changes to waste are modest (in the region of a 0.24% decrease to a 0.26% increase in overall waste). However, the report estimates a 25% switch to paper bags without any concrete evidence to support this assumption. It also requires the assumption that 36% of those who remain using a bag (as opposed to those who refuse bags) switch to paper. This seems like an unreasonable assumption given the Irish experience. The Irish government noted when introducing the plastic bag levy that if there was a considerable leakage to paper bags, a levy would be introduced on these bags too. As of now, paper bags remain exempt from the levy. One would expect that if paper bags were used in 25% of the retail exchanges, the government would be investigating extending the levy. There is no such policy interventions planned at the time of writing. The report also suggest that litter will also be reduced, but the report notes that plastic bags are a small proportion of overall litter, ignoring the visibility and durability of such items. In general, the levy revenues are expected to cover set-up and administrative costs.

There are between 15 and 20 small and medium enterprises involved in the manufacture, importation and distribution of plastic bags in Scotland. The report foresees negative consequences for all (accounting for approximately 300-700 job losses directly). This is again contrary to the Irish experience. While a number of firms ceased operating, the plastic bag levy was not cited as the main reason (see Convery et al., 2007). Irish firms involved in the plastic bag industry were able to show a greater flexibility than is hypothesized in the Scottish experience. As noted, the bill was eventually withdrawn in October 2006.

Convery et al. (2007) have shown that the personal commitment of the lead Minister was instrumental in guiding the proposed levy through the various administrative hurdles. For instance, personal communications with the Minister of Finance ensured that the Department of Finance accepted that the revenues from the levy could be ring-fenced and administered directly by the department of the environment, heritage and local
government. This may be a depressing for advocates of policy interventions such as this. We have seen that the levy needed the guidance of a senior Minister to first get on the policy agenda and then to overcome initial opposition. In addition, no similar levy proposals have been enacted elsewhere despite widespread interest.

4. **Longer Term Analysis of the Performance of the Plastic Bag Levy:**

4.1 *Revenue Returns as an Indication of Plastic Bag Usage:*

Under the provisions of the establishing legislative act – the Waste Management (Amendment) Act, 2001 - the Irish taxation collection body, The Revenue Commissioners, are responsible for collecting revenues from the retailers arising from purchases of plastic bags. As noted, the revenues from the levy are ring-fenced into an Environment Fund that is then administered by the Department of the Environment, Heritage and Local Government. Convery et al. (2007) concentrated on the administrative and institutional interactions and investigated the impact on bag consumption up until 2004. In this paper we are able to take a longer term look at the impact on bags entering the consumption stream and then draw some conclusions as regard to the downstream evidence. As reported in McDonnell (2003) and Convery et al., (2007), estimated bag consumption reduced by some 94% on pre-levy levels. Presented below are the revenue returns for the 5 and a half year period from March 2002 to August 2007.

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue Returns €</th>
<th>from 07/02</th>
<th>to 08/07</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>7,188,973.48</td>
<td>from 07/02</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>12,750,954.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>13,536,752.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>17,544,295.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>18,701,367.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>15,565,283.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>85,287,627.29</td>
<td>from 07/02</td>
<td></td>
</tr>
</tbody>
</table>
August 2007 is the latest return date available at the time of writing and it is also the last collection period before the levy is increased to 22c per bag. The levy was introduced in March 2002 so the first full year of operation was in 2003. We see that in each of the years since the levy has been introduced, the returns have increased (indicating an increase in consumption of plastic bags). By 2006, the last full year of collection, we see that returns are some 46% higher than in 2003 – the first full year of the levy operation. Some of the large jump in returns in 2005 was due to an audit of retailers returning revenues but since then levy returns have continued to increase. We are also able to investigate the year-on-year returns so that we can analyse the levy from its inception. The first revenue returns for the levy (which began in March 2002) were in July 2002. Looking at the period July 2002 – June 2007, we see further interesting relationships (outlined below):

### Table 2: Year on Year Revenue Returns from the Plastic Bag Levy July 2002- June 2007

<table>
<thead>
<tr>
<th>Full Year</th>
<th>Revenue Returns €</th>
<th>% Increase Year on Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2002 -June 2003</td>
<td>13,593,799.35</td>
<td>-</td>
</tr>
<tr>
<td>July 2003 -June 2004</td>
<td>12,980,863.94</td>
<td>(4.51%)</td>
</tr>
<tr>
<td>July 2004 -June 2005</td>
<td>16,069,569.79</td>
<td>23.79%</td>
</tr>
<tr>
<td>July 2005 -June 2006</td>
<td>17,751,812.69</td>
<td>10.47%</td>
</tr>
<tr>
<td>July 2006 -June 2007</td>
<td>20,389,222.59</td>
<td>14.86%</td>
</tr>
</tbody>
</table>

We can see that in the second full year of operation, that the levy returns were smaller than in the first full year by almost 5%. However, since this period, returns have increased rapidly so that returns in June 2007 were over 49% higher than four years earlier. In addition, in the most recent full year, levy returns broke €20 million for the first time. The most recent returns (for August 2007) are some €1.94 million ahead of returns at the same point in 2006 indicating a continued increase.

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8 Personal Communication with John Medley, Revenue Commissioners.
It must be remembered that, based upon the average estimates of pre-levy consumption provided by Fehily et al. (1999), the returns for June 2003 (€13.6 million) represent about 6% of pre-levy consumption of bags (McDonnell, 2003). The number of bags being consumed as of June 2007 is about 9% of pre-levy consumption. This indicates that while there has been some increase in consumption, the year-on-year consumption is still about 91% below levels immediately before the levy introduction.

However, there remains the question as to why the number of bags being consumed by Irish shoppers has increased from such a low base after the introduction of the levy. One may suggest that the effect of the levy has begun to wear off. Conversely, the rise may be a natural response after the initial ‘shock period’. The fact remains however, that the most recent revenues are almost 50% higher than in the first full year of operation and some 57% higher than the lowest level (July 2003 – June 2004). It must be remembered that some of the increase is due to the audit of retailers in the 2004/2005 period. Without further detailed analysis, it is difficult to estimate how much of the remaining increase is attributable to the aforementioned initial shock factor (highlighted and discussed by McDonnell 2003 and Convery et al., 2007) in terms of changing consumer behaviours. Caution is urged in this regard; as such conclusions would ignore the fact that the Irish retail sector has been buoyant over the period of analysis. There have been large increases in the volume of retail sales and, by European Union standards; Ireland has experienced reasonably high inflation rates over the same period. Retail businesses (excluding motor sales and bars)\(^9\) have experienced significant increases in the volume and value number of good sold. For instance, the seasonally adjusted volume of goods sold in July 2007 was 44.8% higher than in 2000 and the value of those goods was higher by 59.3% (CSO, 2007a). In terms of inflation, the consumer price index (CPI) indicates that prices have increased by approximately 22.7% over the period December 2001 to August 2007 (CSO 2007b). These figures indicate that the volume of sales (and presumably transactions) has increased markedly and that the level of the levy (15 cent) has declined in real terms over the analysis period.

\(^9\) All retail businesses excluding motor trades and bars include: clothing and footwear in specialised stores, household equipment, books, newspapers, stationery and other goods, food businesses and all non-food retails businesses. (CSO 2007a)
Taken together, it might be reasonable to assume that the above factors have contributed to the increase in use of plastic bags from a low in 2003/2004. As already noted, it is worth considering if the initial levels in plastic bag usage were artificially suppressed due to the intense coverage given to the levy introduction. In addition, it seems that the revenue returns were artificially low due to the absence of some retailers (rectified with the revenue audit in 2004/2005). However, without considerable analysis of consumer behaviour over the time period, it is difficult to differentiate the impact of these factors.

4.2 Indicators of Environmental Performance:

As mentioned at the outset of this paper, the main motivating factor for the introduction of the levy was to reduce the consumption of plastic bags and ultimately their impact on litter and litter visibility. McDonnell (2003) and Convery et al. (2007) used a number of different sources in an attempt to quantify the down stream effect of the levy. Primary among these sources were the series of annual litter monitoring reports (Litter Monitoring Body 2004, 2005, 2006). As noted previously, plastic bag litter declined from approximately 5% of the national litter composition before the levy to 0.22% in 2004 and 2005 (Litter Monitoring Body, 2004, 2005, 2007). This represents a compelling trend that plastic bag litter has been reduced significantly since the introduction of the levy. Interestingly, if we look at the most recent report (Litter Monitoring Body, 2007); we see that the composition of national litter made up by plastic bags has increased to 0.52%. While the overall figure of bags in the environment remains small, it marks a reversal in the trend of sharp decline that has existed since the levy was introduced and may mirror the increase in plastic bags being consumed at point of sale. In addition, this is the highest recorded figure of plastic bags in the environment since the levy was introduced.

Convery et al. (2007) were also able to draw upon a number of litter surveys or urban areas conducted by the consortium of Irish Business Against Litter (IBAL) and An Taisce (the National Trust of Ireland). These surveys indicated that between January 2002 and April 2003, the number of areas clear of plastic bags had increased by 21%. This trend has continued in recent years. The figure below presents the survey data collected from
10 national litter surveys conducted from January 2002 (just before the introduction of the levy) until the Spring 2007 survey. As noted in Convery et al. (2007) the number of clear areas immediately increased, since then this improvement in sampled areas clear of plastic bags has continued with some interesting seasonal variations. Generally, we can see a peak of clear areas in the Summer time (perhaps when masking vegetation is at its greatest) while in the winter the clear areas tend to decline. Unfortunately, there were only two surveys conducted in 2006 compared to three in 2003-2005 and four in 2002. The results are in slight contrast to the national litter surveys conducted by the Litter Monitoring Body. However, while the first study measures the volume of surveyed litter, the IBAL and An Taisce methodology investigates the visibility of litter over specific geographical distances. The apparent seasonal variation could also have implications for the Litter Monitoring Body and its methodology. The trend evident from the IBAL survey is that there is a reasonably large variation in plastic bag visibility depending on the time of the year that surveys are conducted. The Litter Monitoring Body asks all local authorities to conduct a uniform litter survey in their responsible area. However, there is little uniformity about the time of year that these surveys are conducted. Indeed, there is a concerted effort to ensure that surveys are conducted throughout the year (Litter Monitoring Body, 2006).

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10 As part of the IBAL Anti-Litter League, An Taisce monitors all towns of population 6,000 and over, independently in accordance with international grading standards. For more see: http://www.ibal.ie/v1/default.php?content=index.php
4.3 Increasing the Levy from 15c to 22c

In late 2002, the department estimated that per capita usage of plastic bags for the Irish population had fallen from 328 bags to just 21 bags, as of 2007 that figure had risen again to a modest 30 bags per person per year.\textsuperscript{12} As a result, the government came under increased pressure in regard to the perceived slippage in the effectiveness of the levy (Brennan, 2007).\textsuperscript{13} Reversing this recent increase has been given as the main reason why

\textsuperscript{11} The table is adapted from data provided by IBAL through direct communication. For more detailed information, contact the authors directly.
\textsuperscript{12} http://www.environ.ie/en/Environment/Waste/PlasticBags/News/MainBody,3199,en.htm
\textsuperscript{13} In addition to this source, one of the authors has considerable personal communications with the author of the unpublished thesis who is also one of the lead personnel in the Revenue Commissioners in charge of the plastic bag levy implementation.
the levy was increased. When the plastic bag levy was introduced, a provision was made in the enabling legislation that allowed for an increase in the levy to a maximum of €0.22 per bag (Waste Management (Amendment) Act, 2001) without the need for additional legislation. In February 2007, the Minister for Environment, Heritage and Local Government announced that it was the government’s intention to do just that. The statutory instrument that enacted the levy increase was signed by the Minister on April 27th 2007 and became operational on July 1st, 2007 (DEHLG, 2007).

In introducing the increase, the Minister indicated that the goal of the levy was not to maximize revenue but to minimise plastic bag usage and reduce consumption levels to 2002 levels and beyond. However, in a mirror of the original policy process, there has been no attempt to quantify what effect the levy increase will have on plastic bag usage. The main constraining factor in increasing the levy further beyond €0.22 was the need for additional legislation rather than any price elasticity analysis related to the levy increase or quantification of the marginal external costs of plastic bag litter. While beyond the scope of this paper, given such an explicit policy aim, it is the intention of these authors to investigate how successful the increase in the levy level will be in achieving such reductions in the future.

4.4 The Environment Fund:
As noted already, all returns from the plastic bag levy are hypothecated into a ring fenced Environment Fund along with funds from the associated landfill levy. This hypothecation of revenues is unusual in Ireland. Generally, all tax revenues collected by the Revenue Commissioners go into the general government fund and each department is allocated an annual budget. An exemption for the plastic bag levy was secured by the then Minister for Environment through personal communication with the then Minister for Finance. The motivation for such an exemption was that it would be more acceptable to consumers if they were explicitly aware that the tax was environmental in focus and that revenues would be used for solely environmentally related purposes (for more see Convery et al., 2007). As noted, the levy has raised in excess of €85 million. This revenue along with receipts from the landfill levy (and the interest earned on these sums) have been used for
a wide range of environmentally-related projects from the provision of recycling facilities and return centres to waste awareness and education schemes and campaigns (CAG, 2007). The revenues have also been used to fund the operational costs of running the recycling facilities and enforcement of the various element of the waste management acts. It is unclear how much of this funding would have been available in the absence of such receipts from these levies but it seems that there has been some displacement of funds to offset the increase in revenues due to the levy.\textsuperscript{14}

5. Conclusions:
As noted previously, the Irish plastic bag levy created considerable interest from policymakers tackling similar problems elsewhere in the world. However, as of now, the Irish example remains alone as a levy-only intervention in tackling plastic bag litter and visibility – the pre-conditions above have not been met. Although a large number of countries in Africa have investigated levies, a more common practice has been the banning of bags below a certain width (these bags are more likely to rip and therefore are less suitable for reuse) in tandem with some levy aimed at producers. In jurisdictions and markets with large informal sectors, the successful imposition of a levy may be hindered through mass avoidance of the tax and lack of enforceability. However, in Ireland, where the authority with responsibility for collecting taxes has an existing database of retailers who are paying sales tax, such concerns were lessened. Even in this case though, the initial database of potential retailers was vastly overestimated. Initially, 25,000 retail outlets were thought be liable to pay the tax but by 2007, this number has been whittled down to approximately 5,000 (Brennan, 2007). Such administrative concerns about data reliability and the administrative burden lead to the initial recommendations that the incidence of the levy fall upon the producers/distributors by advisors to the DEHLG (Fehily et al., 2001). In jurisdictions where relevant databases are not so thorough this may indeed be a compelling argument.

The levy achieved a relatively easy passage due to the commitment of the Minister and the DEHLG to introduce such legislation. As we have seen in Convery et al. (2007),

\textsuperscript{14} Personal communications with staff in the DEHLG.
initial opposition from the stakeholders was quickly assuaged through a realisation that a
levy was certainly on the agenda, but that there was flexibility and flexibility on the part
of the DEHLG in the manners of implementation. These developments allowed the
proposal to continue along the policy process track where other measures may have
failed. As we have already noted, this finding may be a double edged sword. While it
guaranteed the enactment of the levy, the rationale of the levy itself was not the primary
influence in that process. It required the guidance of a senior Minister to first get on the
policy agenda and then to overcome initial opposition.

One of the most compelling elements of the levy was the ring-fencing of receipts into an
environment fund to be spent on specifically environmentally related projects. Even with
a suspicion that revenues arising from the fund are being offset elsewhere, it has a
powerful impact on the perception of the levy amongst stakeholders and the public.
Accordingly, retailer concerns that they would be blamed for excessive profit taking (this
was the period of the Euro changeover in which such claims were common) were
substantially reduced. It also differentiated the levy from other taxation instruments in the
minds of the consumers (see Convery et al., 2007). Perhaps a primary reason why a
similar levy has not been introduced elsewhere is the reluctance of finance ministries to
give up authority over general government revenue administration that was required in
this example.

The environmental performance of the levy is unquestioned. As we have shown, the levy
was responsible for approximately a 94% initial decline in plastic bag consumption.
While there has been some rebound, the total impact is still relatively minor in relation to
the huge initial decreases. As we have shown, it is difficult to accurately differentiate the
influences on this gradual increase. We hypothesised that it may be due to a combination
of a buoyant retail sector, relatively high inflation reducing the real cost of the levy to
consumers and indeed a small decline in the levy’s influence. But the aim of the levy was
not to reduce plastic bag consumption to zero but to give each bag a real economic price,
if it was the former it would have been administratively simpler to ban these items.
Initially, it seems that in very few cases did consumers value the purchase of a plastic bag
at or above €0.15. One would expect, with the influences outlined above and a static levy rate that more consumers would enter the market for plastic bags.

We have also noted that the processes that lead to increasing the levy in mid 2007 suffered from the same failures as the original process in that there was no attempt to quantify the marginal external costs of plastic bags in the environment. In this regard, while the levy remains one of the most cited examples of product taxes of this type by policymakers, it does not contain the characteristics of a Pigouvian tax. Indeed, the primary influencing factor for determining the new levy level was the ceiling prescribed in the current legislation. Given the explicit policy aim to reduce plastic bag consumption to levels seen in 2002, it will be interesting to analyse the impact of the increase from €0.15 to €0.22.

Despite these problems, the Irish plastic bag levy remains one of the most cited examples of a successful environmental product tax. As we have seen, in almost every other jurisdiction, investigating interventions in this area, the Irish case study is cited. We have also seen that the administrative burden remains small and that its environmental performance in reducing the consumption of plastic bags remains spectacular. In addition, the indications are that this reduction in consumption has reduced the level and visibility of plastic bags in the general Irish environment. This, after all, was the initial motivation for introducing such a levy. Despite its shortcomings, it remains successful in this regard.

Finally, based upon Irish and international experience with mitigating usage of plastic bags, we tentatively can conclude that a levy is most likely to be introduced when the following conditions prevail:

- There is a requirement for strong political leadership at the highest level. This was manifest in the minister of environment at the time. We have seen that similar legislation introduced in other jurisdictions fell because of the lack of a clear leadership role at ministerial level.
• A tax collection system already in place which can be modified at low cost to include the levy – this may be the reason why developing countries that considered imposing a levy opted instead for a combination of policy instruments or just an outright ban.

• If required, focus in the policy process on the visibility of plastic bag litter rather than a narrow analysis of its share of general waste. Plastic bag litter is very likely to constitute a miniscule proportion of waste or general litter by, for instance, weight. However, as we have seen, the special characteristics of the item resulted in a much higher visibility in Ireland. For jurisdictions, contemplating a similar policy intervention, policy analysis should include impact analysis of plastic bags related to their visibility and some quantification of such.

• Some compliance with a plastic bag manufacturing industry. We have found that in Ireland there existed a very weak plastic bag manufacturing industry, most bags were important and such firms were able to diversify into other areas. Other stakeholders were also very much involved in the policy process from the early stages. The existence of a stronger industry without so much involvement in the policy development process may have prevented the implementation of the levy in Scotland.

• A Ministry for Finance that open to some compromise as regards the ring-fencing of the taxation revenues for environmental purposes. This was a major selling point of the tax to the general public and clearly aided in its acceptance by such.

• A policy and political culture that can take original paths in diverse areas. In Europe, Ireland pioneered low corporate taxation, with its 12.5 per cent rate, since emulated by a few of the new Member States, it was the first country in the European Union to ban smoking in all workplaces, and, as we have seen, it pioneered the introduction of the plastic bag levy. In each of these cases some political capital was required to implement such policies. The latter two initiatives would be considered minor policy initiatives in terms of overall health or environmental policy but created a major impact in terms of public perceptions.
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