The Potential Economic Impact of Plain Packaging for Cigarettes and Fine-Cut Tobacco in Ireland
Executive Summary

The Irish Minister of Health has announced his intention to follow Australia's lead and implement plain packaging for cigarettes and fine-cut tobacco, possibly as early as next year (2014).

This study estimates that if plain packaging is introduced in Ireland, a total of 1,900 jobs and EUR 125 million in annual tax revenue are at stake. Most job losses are not expected in the tobacco sector, but rather in the rest of the economy. Tax losses are likely to translate into a significant contraction of the Irish economy, much higher than would be expected in "normal" times, i.e. without the current financial crisis, the tough austerity programmes and the deficit limits Ireland faces today and in the near future. The likely tax losses due to plain packaging are particularly worrying since taxation of tobacco products accounts for almost 3% of the Irish government's total revenues, far above the EU average.

Plain packaging will lead to commoditisation, and thus pricing on the tobacco market will become much more aggressive, triggered in particular by illicit market suppliers who earn high margins. All legal market segments could see heavy losses due to plain packaging, while the illicit market could grow by up to 40%. This is particularly alarming since the illicit market share in Ireland is already among the highest in the EU.

Since, at this stage, it is not possible to base an assessment of the effects of plain packaging on direct evidence – its recent introduction in Australia has not yet been evaluated using empirical methods – we use a simulation-based approach based on a standard economic model to derive our estimates. Our quantitative analysis draws on estimates from empirical research about smokers' willingness to pay for branded versus unbranded packs, the industry's potential adaptations in pricing as well as consumers' likely product substitution behaviour when plain packaging is introduced.
1. Plain Packaging in Ireland: Background

The Irish Minister of Health has announced his plan to follow Australia's lead and adopt plain packaging.

In May 2013, Irish Minister of Health James Reilly announced plans to introduce plain packaging, possibly as early as next year (2014). This would make Ireland the second country in the world after Australia to introduce such legislation. Plain packaging, also known as "standardised" or "generic" packaging, bans all branding, colour and logos on tobacco product packaging other than the brand name and variant, which may only be printed on specified locations on the pack in a uniform typeface, size and colour. All tobacco packaging must use the same defined colour and carry health warning labels.

The Australian Plain Packaging Act 2011 is being challenged at the World Trade Organization (WTO) by Cuba, Honduras, the Dominican Republic and Ukraine (Indonesia also requested a consultation on September 20, 2013) and is subject to pending litigation. In light of these challenges, New Zealand has put on hold its plans to introduce plain packaging and the UK government has announced that it will not further pursue such policy at this time.
Ireland plans to introduce plain packaging in addition to the standardisation measures stipulated in the current draft of the new EU Tobacco Products Directive.

In December 2012, the European Commission adopted a proposal for a significantly revised new Tobacco Products Directive (TPD). Among other things, the proposal included a ban on slim cigarettes, a ban on menthol cigarettes, large combined (pictorial and textual) health warnings covering 75% of the front and back panels of packets, mandatory shapes, format and dimensions for tobacco packaging, and further restrictions on product descriptions and brand differentiation. The potential impact on jobs and tax revenue of these policy interventions was analysed in our study "The New Tobacco Products Directive – Potential Economic Impact".

During the EU legislative process, Parliamentarians and the Member States have discussed whether to introduce additional restrictions, including plain packaging for cigarettes and fine-cut tobacco. However, the lead Parliamentary Committee on the TPD, the Environment, Public Health and Food Safety Committee (ENVI), all five European Parliament opinion-giving committees as well as the EU Employment, Social Policy, Health and Consumer Affairs Council (EPSCO) recently rejected the idea of introducing plain packaging Union-wide.

2. The Irish Market for Cigarettes and Fine-Cut Tobacco: Status Quo and Historical Trends

The tobacco sector in Ireland accounts for about 5,500 jobs and is a major driver of tax revenue, generating currently about EUR 1.4 bn per year.

In 2012, the tobacco sector accounted for about 5,500 jobs, almost all of them in manufacturing (about 40% of the 5,500 jobs), wholesale, distribution and retail. Tobacco taxes (excise and VAT) accounted for about EUR 1.4 bn that same year, almost 3% of the Irish government’s total revenues, far above the EU average.

The legal cigarette market in Ireland has been gradually declining in recent years. A key reason for this is a thriving illicit cigarette market.

In 2012, about 3.7 bn cigarettes were sold legally in Ireland, 45% less than legal sales in 2002. The premium segment was particularly hard-hit, with sales dropping by more than 50% over the last 10 years (see figure 2). A notable development occurred in the fine-cut segment, which was virtually non-existent before 2008. In 2012, almost 500 million cigarette stick equivalents from fine-cut were legally sold.
The market share of illicit tobacco, which has increased significantly over the last decade, accounted for about 19% of the total demand for cigarettes and fine-cut in Ireland in 2012 according to the KPMG Project Star 2012 results.\(^5\) Triggered by high cigarette prices, inadequate penalties for offenders and easy access for suppliers,\(^6\) this is one of the highest illicit market shares in Europe,\(^7\) topped only by the Baltic countries. The Revenue Commissioners estimated illegal cigarettes to represent a loss to revenue of approximately EUR 258 m (excise and VAT).\(^8\) A growing illicit market is particularly problematic not only for loss in tax revenue but also for the loss of jobs in the legal tobacco sector.

### 3. Assessing the Impact of Plain Packaging in Ireland: The Economic Rationale Behind Our Modelling Approach

This study attempts to quantify the potential economic effects of introducing plain packaging on jobs and tax revenue in Ireland.\(^9\) It does not, however, address the impact of potentially substantial burdens on the public coffers that could ensue from having to pay compensation to the tobacco manufacturers for the deprivation of their brands resulting from mandatory plain packaging.\(^{10}\)
Plain packaging is likely to influence consumer behaviour

To analyse the economic impact of such a fundamental policy intervention, it is crucial to consider that packages and thus brands will not only be perceived as less valuable but also that they will become almost indistinguishable for consumers. Plain packaging is thus very likely to affect consumers’ perception of the attributes and qualities of cigarettes and fine-cut.\textsuperscript{11} In fact, one of the stated goals of plain packaging is to diminish the attractiveness of legal tobacco products. Therefore, plain packaging is likely to affect consumer brand selection across price segments.\textsuperscript{12}

From an industrial economics and product marketing perspective, plain packaging has the potential to transform the cigarette and fine-cut market from a highly differentiated product market into a commoditised market with essentially homogenous products.\textsuperscript{13} With considerable brand power and strong consumer attachment to their favourite brands – essentially the current situation – tobacco companies are able to charge a price premium for brands with a high brand value.\textsuperscript{14} Under plain packaging, however, this is likely to change fundamentally, drawing consumers’ attention to cheaper or even illicit tobacco products. For example, there is empirical evidence that the willingness of consumers to pay a higher price for a specific brand perceived as more attractive than other brands is likely to fall as cigarette packaging becomes plainer.\textsuperscript{15}

Two types of consumer reactions have to be taken into consideration when analysing the economic effects of plain packaging:

**Downtrading:**\textsuperscript{16} With a lower willingness to pay for premium brands, consumers will tend to move to cheaper cigarettes or other cheaper tobacco products such as fine-cut tobacco. This will put pressure on prices in the legal market in order to defend market shares.

**Illicit market growth:** Unbranded packs increase the perceived product homogeneity on the cigarette market. Therefore, illicit products become a closer substitute for legal cigarettes and fine-cut. Also, illicit products are likely to further gain popularity and market share because branded products will continue to exist (only) on the illicit market.

Both downtrading and the growth of the illicit market would result in changes in the Irish tobacco sector leading to job and tax losses. The threat stemming from the illicit market is particularly harmful, since illicit cigarettes generate no tax revenue at all, and the value chain of, and employment in, the illicit market are primarily located outside of Ireland – and mostly even outside of Europe. Additionally, employment in the illicit market is closely tied to criminal behaviour – an undesirable situation.
We combine estimates of consumers’ willingness to pay with the industry's potential adaptations in pricing and consumers' likely product substitution behaviour to develop our estimate of the effects of plain packaging on jobs and tax revenue in Ireland.

For our analysis, we differentiate between four tobacco market segments, namely premium cigarettes, below-premium cigarettes, fine-cut tobacco and illicit cigarettes. Based on changes in the composition of these market segments caused by plain packaging, we derive changes in tax revenue. Direct employment effects are calculated based on the value added in each market segment. Indirect employment effects resulting from losses in tax revenue are also taken into account.17)

Recent empirical literature enables us to quantify the potential decrease in consumers' willingness to pay for unbranded versus branded cigarettes.

At this stage, it is not possible to base an assessment of plain packaging on direct evidence of the effects. The recent introduction, in December 2012, of plain packaging in Australia has not yet been evaluated with empirical methods. However, lab experiments on consumer behaviour enable us to derive estimates of the potential effects of plain packaging on consumers' market behaviour and thus on jobs and tax revenue. A more comprehensive impact assessment – based on direct evidence and adopting advanced simulation-based or econometric methods – is beyond the scope of this study.

In their paper “Estimating the impact of pictorial health warnings and ‘plain’ cigarette packaging: Evidence from experimental auctions among adult smokers in the United States”, Thrasher et al.18) compare the willingness to pay for cigarettes in two situations similar to the ones we compare, namely (1) the status quo and (2) a situation with plain packaging.19) Building on the results of Thrasher et al., we estimate that in comparison to the status quo, plain packaging lowers consumers’ willingness to pay for legal cigarettes by about 17%, uniformly across consumer types.

At the same time, overall cigarette demand is assumed to remain unchanged. The public health objectives for a plain packaging measure depend on a presumed causal effect on smoking, and some have suggested that plain packaging might lead to a decrease in consumption.20) Others have estimated such policy would lead to an increase in consumption.21) Our analysis does not assume an increase in demand but concludes that the most realistic scenario is that consumption will stay flat.
This no-change scenario forecasts that lower cigarette demand due to lower willingness to pay is offset by a combination of:

1) Firms’ pricing behaviour, leading to lower cigarette prices,
2) Downtrading, i.e. purchase of more affordable legal cigarettes, and
3) Shifts in consumer demand towards the illicit market, which offers cheaper and branded products.

In the Appendix, we sketch a simulation that demonstrates how changes in firms’ pricing behaviour due to lower willingness to pay and increased price sensitivity of consumers can lead to such a market outcome.

In summary, our subsequent analysis is based on a realistic scenario which sees strong consumer reactions to plain packaging and a constant overall cigarette demand.

### 4. The Potential Economic Impact of Plain Packaging in Ireland

This study estimates that if plain packaging is introduced in Ireland, in total 1,900 jobs and EUR 125 m in tax revenue are at stake.

Plain packaging is estimated to cost up to 1,900 jobs in comparison to a situation without plain packaging. Most job losses (about 88%) are not expected in the tobacco sector but in the rest of the economy and are triggered by the loss in tax revenue and the negative growth effects induced on the Irish economy. Tax revenue under plain packaging will likely decline by up to EUR 125 m compared to a situation without plain packaging.

**FIGURE 3: KEY FINDINGS – POTENTIAL IMPACT OF PLAIN PACKAGING**

<table>
<thead>
<tr>
<th>POTENTIAL IMPACT</th>
<th>Lost jobs [# jobs]</th>
<th>Loss in tax revenue [EUR m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain Packaging</td>
<td>~1,900</td>
<td>~125</td>
</tr>
</tbody>
</table>

Source: Roland Berger analysis
It should be kept in mind that part of the potential reduction in brand value will take place gradually. The full effect of plain packaging is, therefore, likely to materialise over a few years after its introduction.

**Plain packaging is likely to lead to strong price competition triggered by illicit market suppliers. This will put pressure on prices in all legal segments.**

Our analysis suggests that average prices will decline in all segments due to plain packaging. The reason for the drop in prices can be directly related to product commoditisation. Plain packaging shifts the tobacco market from a highly differentiated product market towards a commoditised market (see section 3). Price competition will therefore intensify, leading to falling margins and increased consumer switching across segments. A new pricing strategy is likely to evolve particularly from illicit market suppliers. The more homogenous cigarettes become, the easier it is to trigger segment switching with price changes. Since illicit traders do not pay taxes, they have by far the greatest scope for sacrificing margins in order to gain market share and maximise profits.

We predict that in response to plain packaging illicit market suppliers will switch to more aggressive pricing with price cuts up to 30% due to plain packaging. The legal market – in order to defend market shares – will likely react by cutting prices between 3% and 5%.

**As a result of plain packaging, all legal segments will lose significant market share, while the illicit market will grow by up to 40%.**

The most important driver of the economic and fiscal effects of plain packaging is an increase in the illicit market. The illicit market is also likely to grow as a result of plain packaging, as counterfeiting will become significantly easier and consumers' willingness to consider purchasing their preferred product from black market sources will increase in a commoditised tobacco market. We estimate that the illicit market could grow by about 40%, i.e. from about 1 bn sticks in the status quo without plain packaging to 1.4 bn sticks (see figure 4).

It is important to note that illicit trade develops dynamically. As illicit trade becomes more widespread, this translates into a higher social acceptability of, and an easier access to, illegal tobacco products. This, in turn, may lead to even more consumers switching to black market channels.
5. The Case for a Comprehensive, Evidence-Based Impact Assessment of Plain Packaging

In order to develop a comprehensive impact assessment of the potential economic effects of plain packaging, several additional aspects would need to be considered that are not within the scope of this paper. The Irish government has set fairly high standards for Regulatory Impact Assessments (RIA) that must be followed prior to any significant decision to regulate in Ireland. These standards should guide an evidence-based assessment of plain packaging in Ireland.

Plain packaging should be evaluated according to the Irish RIA standard to achieve "better regulation".

Plain packaging should be evaluated according to the standard to achieve "better regulation" as defined in the Revised RIA Guidelines of the Department of the Taoiseach and the principles of Better Regulation identified in the Irish Government's White Paper Regulating Better. Based on these self-imposed "Better Regulation" principles, key questions guiding a comprehensive regulatory impact assessment of plain packaging in Ireland would be:
Is plain packaging effective in reducing smoking prevalence, smoking initiation rates, as well as smoking intensity (the number of cigarettes smoked per capita)?

Is plain packaging a proportionate way to achieve these goals? Is there a better way to achieve the same goals?27)

Good tobacco regulation should help achieve predefined health goals without harming tax revenue, economic operators (for example by impairing intellectual property rights of tobacco manufacturers) and the economy as a whole – at least not more than necessary. In an impact assessment of the proposed plain packaging, policymakers must look at:

Changes in price elasticities, willingness to pay and cigarette demand across different price segments due to plain packaging

Effects of plain packaging on sales (and therefore on tax revenue), including the possibility of downtrading and substitution of legal cigarettes with illicit cigarettes

Changes in market competition and reconsideration of companies' pricing strategies – including the possibility of price cuts due to increased price competition

Potential increases in legal and illegal cross-border distance sales

Incentives for market entry of new legal, low-price brands.

A model-based, quantitative methodology to assess the impact of plain packaging before adopting such a measure is crucial.

Legitimate health goals – such as lowering smoking prevalence – could be pursued through tobacco control measures that have proven effective.28) As an example, awareness programmes for the younger population appear to be effective in reducing tobacco consumption.29) Strong and effective enforcement of minimum age laws at retail as well as school-based interventions to prevent youth access to tobacco from social sources also have this effect.

Until the Australian plain packaging example is evaluated using scientific (empirical/statistical) methods, no empirical evidence will exist on the effects of plain packaging. Evidence-based tobacco control policies are preferable. The key guiding question should be: are there tobacco control measures other than plain packaging that have been shown to be effective and which have no or less severe economic and fiscal side effects?
6. Plain Packaging During the Fiscal Crisis in Ireland: An Expensive Measure at the Time of Financial Crisis

The current Irish financial crisis, which is rooted in the financial crisis of 2007-08, is responsible for the country’s slide into recession for the first time since the 1980s. As EU and Eurozone policies in response to the crisis are seeing initial results - including in Ireland - it is of high importance that fiscal imbalances are not aggravated by avoidable tax deficits. In 2012, according to the Irish Department of Finance, Ireland’s budget deficit for 2012 was 7.6% of GDP, comfortably inside the EU-IMF troika’s target of 8.6%.

Projections for 2013 and the following years include even higher structural adjustments. The current forecast deficit for 2013 is 7.4% of GDP, within the programme target of 7.5%. With financial support from the EU, Ireland has implemented significant adjustment programmes to consolidate its public finances.30)

In order for the Irish economy to recover, it is vital that fiscal imbalances are not aggravated by tax deficits which could otherwise be avoided. Tobacco taxation contributes more than EUR 1 bn per year to Irish revenue (excluding VAT). Including VAT, tobacco taxation covers almost 3% of total gross revenues (including tax revenue, duties and social security contributions) in Ireland. According to our estimates, plain packaging could result in a loss of up to EUR 125 m in total tax revenue. Since the budget deficit has to be brought down according to a tough adjustment path, losing tobacco tax revenue implies either increasing other taxes or decreasing public spending.

In summary, tax revenue in Ireland is currently particularly precious due to the crisis. It is therefore important to stabilise revenue from tobacco taxation in order to avoid tax deficits. We have shown how the introduction of plain packaging would deprive the economy from tax revenues due to consumers’ substitution of legal products with cheaper and illicit products. Legitimate health goals could be pursued through tobacco control measures that, unlike plain packaging, have proven effective without harming tax revenue.
Appendix – Concise model description and calibration strategy

This appendix provides important technical aspects of our modelling approach. The explanation is kept as non-technical as possible.

Modelling overview

As already sketched in section 3, we consider a quantitative model of the economy with a special focus on four segments of the tobacco sector (cigarettes and fine-cut) that is summarised below as the "cigarette sector". The following figure provides an overview of our model.

![Figure 5: Schematic Illustration of Our Model](source: Roland Berger)

We adopted a standard quantitative economic model describing key interdependencies as well as reasonable ("optimal") behavioural reactions to changes in the economic environment of consumers as well as companies. The economic impact of these changes is assessed in a standard input/output analysis that allows us to make predictions about the likely economic impact of plain packaging on key variables (employment, tax revenue). Dynamic developments have not been considered in our model. It focuses on the allocation (economic outcome) before and after plain packaging.
The general model is specified through demand functions that describe consumers' choices and the decisions of companies which operate in a differentiated product market with price-setting power. The supply side of the cigarette sector is modelled across the entire value chain as described in section 3.

Modelling the demand side

On the demand side, our model describes how consumers demand cigarettes (including fine-cut tobacco) in our four segments. We restrict ourselves to N=4 goods (premium, below-premium, fine-cut, illicit), denoted by \( x_1, x_2, x_3, x_4 \). The price for each good is denoted \( p_i \) (i = 1, 2, 3, 4) and corresponds to the WAP\(^{31}\) (weighted average price) in a segment and includes all taxes (tobacco taxes and VAT). This price represents the consumer retail price.

Key inputs of the demand side are:
> Prices per segment (premium, below-premium, fine-cut, illicit)
> Today’s market shares per segment

Consumer choices

Specifying consumers' preferences through demand functions imposes some restrictions on the demand functions. We require that consumers’ demand can be derived from preferences that are represented by a utility function \( U(x_1, x_2, x_3, x_4) \). It is assumed that consumers make optimal choices (subjectively), taking prices as given.

The aggregate demand system is specified in logarithms (to obtain elasticities in the following equations directly) with constants \( x_1^0, \ldots, x_4^0 \).

\[
\begin{align*}
\log(x_1) &= \log(x_1^0) + \alpha_{11} \log(p_1) + \alpha_{12} \log(p_2) + \ldots + \alpha_{14} \log(p_4) \\
\log(x_2) &= \log(x_2^0) + \alpha_{21} \log(p_1) + \alpha_{22} \log(p_2) + \ldots + \alpha_{24} \log(p_4) \\
\log(x_3) &= \log(x_3^0) + \alpha_{31} \log(p_1) + \alpha_{32} \log(p_2) + \ldots + \alpha_{34} \log(p_4) \\
\log(x_4) &= \log(x_4^0) + \alpha_{41} \log(p_1) + \alpha_{42} \log(p_2) + \ldots + \alpha_{44} \log(p_4)
\end{align*}
\]

The demand for good \( i \) potentially depends on all prices. The higher the price of a good, the lower the demand for this good and the higher the demand for other goods. The intercept terms \( x_i^0 \) reflect the relative attractiveness of good \( i \). It varies from country to country. The parameter matrix \( \alpha = (\alpha_{ij}) \) for \( i = 1, 2, 3, 4, j = 1, 2, 3, 4 \) describes own-price and cross-price elasticities of demand.
For this quite general and flexible demand system to be locally consistent with a utility maximizing consumers requires the following (symmetry) conditions for all price elasticities – relative demand between two segments depends on relative prices of these two segments:

\[
\frac{\alpha_{ij}}{\alpha_{ji}} = \frac{p_j x_j}{p_i x_i}
\]

where prices and quantities are evaluated at the market outcome. This puts restrictions on the parameters in the matrix \(\alpha\), which have to be respected in the calibration of these parameters. At the same time it reduces the number of parameters to be specified.

**Supply side I: market structure and company price-setting behavior**

Companies operate on a standard differentiated product market with price-setting power. We assume that they set their prices to maximize profits. Producer of good \(i\) therefore sets the price \(p_i\) to maximize:

\[
(p_i - c_i) x_i
\]

where \(c_i\) denotes production costs. Companies take into account that their demand \(x_i\) depends negatively on the price \(p_i\) (which they control) and on other variables beyond their control (such as the prices of competitors). Optimal price-setting depends on consumer preferences as reflected by their demand behaviour, which can be summarised by own-price and cross-price elasticities of demand. The latter can be recovered from market shares of the four segments given the initial prices. For companies it is profit-maximising to reset price in response to changes in consumer behaviour triggered by changes in policy.

**Market outcome**

Consumers and companies interact on the cigarette and fine-cut market. Consumers adjust their choices to price changes by companies and changes in their willingness to pay triggered by the new TPD, e.g. due to product standardization. Companies take this response into account when setting their prices. The market outcome, which is governed by the basic relationship that supply equals demand, is defined by prices and market shares in the four segments considered and by the total market volume.
Supply side II: value chain and employment

Given prices and volumes before and after the new TPD, employment effects can be considered. To compute the employment effects of policy changes we proceed as follows:

> Step 1: We compute the value added per cigarette for every type of cigarette for each step of the value chain

> Step 2: We then use our demand/supply system to compute the change in demand for every type of cigarette. This, together with the previous step, yields the total change in value added per step of the value chain

> Step 3: We then use information on how much value added is generated per employee (full-time equivalent) at every step of the value chain

> Step 4: Since we know the change in value added for every step of the value chain in every country, we also know the change in employment per step of the value chain

> Step 5: Adding up these numbers yields the total change in employment

Jobs are estimated from full-time employment by adjusting the numbers up by 20% at every step of the value chain.

Taxation and tax revenue

The tax system is captured in the following way:

> A specific tax $\tau^s$ per cigarette
> An ad valorem tax $\tau^{VI}$
> A minimum excise tax $\tau^m$ per cigarette
> A value added tax $\tau^{VA}$

The total tax per cigarette of price $P$ then equals:

$$\max(\tau^s + \tau^{VI} P, \tau^m) + \tau^{VA} P$$

The total change in tax revenue is computed by calculating new quantities and prices from the demand/supply system and then applying the tax system previously described.
Calibration of model parameters: strategy

The parameters of the demand system can be summarized by the 4 by 4 matrix $\alpha = (\alpha_{ij})$ previously introduced. We subsequently sketch how they are calibrated.

We first start with the four diagonal elements. These are the responses of demand $x_i$ to a change in the price of this good $p_i$ (own-price elasticity). We obtain $\alpha_{11} = -1.89$ and $\alpha_{22} = -3.03$ based on Cullum and Pissarides (2004). The choice of $\alpha_{33} = -1.2$ is based on Mindell and Whynes (2000). Finally $\alpha_{44}$ can be chosen between -1.2 and -1 and we set it equal to -1.05. Variations in this range do not affect our conclusions.

The next step is to determine the off-diagonal elements. Here, due to the previously discussed model restrictions, the upper triangular elements are determined once the lower triangular elements are known. This puts some discipline on our parameter choices. We set $\alpha_{31} = \alpha_{32} = 0.38$ and $\alpha_{41} = \alpha_{42} = \alpha_{43} = 1.0$ based on Cullum and Pissarides (2004).

Finally the cross-price elasticity $\alpha_{21}$ is set such that the aggregate demand for legal cigarettes has a price elasticity of -0.5 which is a consensus estimate in the literature, see e.g. Cullum and Pissarides (2004) and Nguyen, Rosenqvist and Pekurinen (2012). This means that a price increase by 10% leads to an aggregate decrease of 5% in terms of demand for legal products.

Product commoditisation is assumed to slightly increase elasticities due to the commoditisation triggered by plain packaging, i.e. the goods in the four segments become closer substitutes. To determine the change in own-price elasticities we use the experimental evidence from Thrasher et al. (2011). These authors find that the envisaged product standardisation would result in a 17% decrease in the willingness to pay in comparison to a situation that resembles the status quo. Applying these estimates leads to a calibration that stipulates increases in price elasticities between 1% for illicit cigarettes, 2.5% for premium cigarettes and 8% for below-premium cigarettes. The most important change in cross-price elasticities is an increase in the cross-price elasticities between legal cigarettes and illicit cigarettes by 30%. This calibration reflects that unbranded packs are more easily substituted for illicit market products after plain packaging is introduced. The elasticity values are still quite conservative. To illustrate this, note that the estimates assume that plain packaging has the effect that an increase in the price of premium cigarettes by 10% increases the demand for illicit cigarettes by 13% (instead of 10% in the status quo).

Since most choices of parameters are directly informed by the data and the remaining values are consistent with results that can be found in the literature, we consider our predicted outcomes to be very realistic.
Endnotes


3) Total (gross) revenues were about EUR 50 bn in 2012 and included social security contributions. See Office of the Revenue Commissioners: Annual Report 2012, Ninetieth Annual Report of the Revenue Commissioners, April 2013. EU numbers are not available including VAT on tobacco products. Excluding VAT, the EU weighted average is 1.4% while the Irish figure is 2% according to Eurostat numbers.

4) A cigarette stick equivalent is calculated by applying the conversion rate of 0.75 g of fine-cut tobacco per cigarette.

5) See the KPMG Project Star 2012 Results, April 2013, available at: www.pmi.com/eng/media_center/media_kit/Documents/Project_Star_2012_Final_Report.pdf. See also Section 5 in the report by Grant Thornton: Illicit Trade in Ireland, Uncovering the cost to the Irish economy, 2013.


7) Also, smoking prevalence in Ireland is remarkably high, seemingly unaffected by the strict tobacco regulation.


9) The current packaging requirements stipulate the application of a textual warning in the two official Irish languages on the front of a unit packaging, occupying 32% of the surface and a combined picture and text warning on the back panel of the unit packaging, occupying 45% of the surface. Tobacco products without combined health warnings may still be sold at retail until 1 February 2014. In addition, unit packets for cigarettes have to carry side panel warnings indicating machine-measured yields for tar, nicotine and carbon monoxide occupying 12% of the side panel surfaces.
10) Legal scholars have argued that plain packaging cannot be introduced by governments in Europe without paying compensation to the tobacco manufacturers for the deprivation of their brands. See e.g. Lord Hoffmann in Annex 5 of Philip Morris Limited’s submission: Standardised tobacco packaging will harm public health and cost UK taxpayers billions: A response to the Department of Health consultation on standardised packaging of tobacco products, August 2012. Available online at: www.pmi.com/eng/tobacco_regulation/submissions/documents/Submission%20and%20All%20Annexes%20(combined).pdf.


16) Downtrading is the switching of consumers from more expensive brands to cheaper alternatives, i.e. downward substitution between quality tiers of a product.

17) For a more detailed explanation of employment effects, please refer to the Appendix.

19) Interestingly, although Thrasher et al. only analyse willingness to pay for branded versus unbranded packs, they prematurely conclude that plain packaging and prominent health warnings with graphic pictures will reduce demand for cigarettes.


22) The firm Saueressig – a leading specialist in printing and packaging – conducted an experiment which they tested the differences of counterfeiting regular cigarette packs vs. Australian-style plain cigarette packs. Saueressig concluded that it is easier, cheaper, quicker and less risky to counterfeit plain cigarette packs (Statement on Plain Packaging and Counterfeit Tobacco Products. Saueressig, 27 March 2013).

23) The impact of standardised packaging on the illicit trade in the UK. SKIM, August 2012.

24) This estimate is likely to be conservative in light of the experimental results from SKIM on plain packaging in the UK. See SKIM: The impact of standardised packaging on the illicit trade in the UK, August 2012, commissioned by PMI, where about 19% of the smokers of legal cigarettes shift to the illicit market after plain packaging is introduced. This number would lead to an 80% increase in illicit trade.

25) See sections 2.3-2.6 on "Primary Legislation" in Department of the Taoiseach: Revised RIA Guidelines: How to conduct a Regulatory Impact Analysis, Dublin: Department of the Taoiseach, June 2009. See also the sections on "effectiveness" (p.16) and "proportionality" (p.20) in Department of the Taoiseach: Regulating Better. A Government White Paper on Better Regulation, Dublin: Department of the Taoiseach, 2004.

27) In particular, it needs to be demonstrated that there are no other effective measures that have less severe economic and fiscal side effects. See the section on the principle of proportionality as well as page 43 (A.29) in the RIA Guidelines.

28) Smoking prevalence rates in Ireland are quite high despite being one of the strictest tobacco regulatory environments within the EU.

29) As a prominent example, consider Germany, where youth smoking prevalence declined from 27.5% in 2001 to 11.7% in 2011 due to education and awareness campaigns, see e.g. the official 2013 drug report at http://drogenbeauftragte.de/fileadmin/dateien-dba/Service/Publikationen/BMG_Drogen_und_Suchtbericht_2013_WEB_Gesamt.pdf.

30) In January 2013, Ireland raised EUR 2.5 billion through the sale of a treasury bond maturing October 2017 with a moderate yield of 3.3%. This success is another important step in the country's re-engagement with the markets as it prepares to exit the EU/IMF programme by the end of 2013.

31) The weighted average price (WAP) is based on retail selling prices (RSP).


35) The value -0.5 is a conservative estimate. Average values up to -1.6 can be found in the literature, see the discussion in Chaloupka, F. and J. Tauras: The Demand for Cigarettes in Ireland, Manuscript, 2011. Available online at: www.hse.ie/eng/health/hl/change/QUIT/demandforcigarettes2011.pdf.

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Roland Berger Strategy Consultants prepared the study "The Potential Economic Impact of Plain Packaging for Cigarettes and Fine-cut Tobacco in Ireland" for, and at the request of, Philip Morris International Management S.A. All judgments and opinions expressed in the studies are those of the authors.

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