

**Economic Analysis of a Display Ban  
and/or a Plain Packs Requirement  
in the UK**

**A Report from  
Europe Economics**

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**2 September 2008**

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## **1 INTRODUCTION AND CONTEXT**

### **Europe Economics**

- 1.1 Europe Economics<sup>1</sup> is a private sector consultancy, based in London, which specialises in the application of economics and econometrics to problems arising predominantly in the fields of public policy, regulation and competition. Our clients include government departments, regulators and competition authorities, companies large and small, professional and trade associations, charities, law firms and public affairs firms. The expert credentials of the Project Director for this report, Dr Andrew Lilico, are set out in his curriculum vitae which appears in the appendix to this report. In particular, Dr Lilico is an expert in microeconomic analysis and regulatory impact assessment.
- 1.2 The Department of Health in the UK published on 31 May 2008 its “Consultation on the future of tobacco control” (hereafter “the FTC Document”). In this context, Europe Economics is providing to JT International (“JTI”) and Gallaher Limited (both members of the Japan Tobacco Group) expert economic advice on the economic issues raised by aspects of the FTC Document. This report sets out the analysis and conclusions of Europe Economics in relation to this.

### **The Options Assessed in this Report**

- 1.3 The FTC Document sets out various options for further tobacco control. However, the analysis in this report is restricted to economic issues arising in relation to:
- Further restrictions of the display of tobacco products in retail environments (often hereafter the “display ban” or “display restrictions”); and
  - What the Department of Health has called “plain packaging”, but which we (for reasons explained below) will typically refer to as the “plain packs requirement”.

#### *Controlling advertising and the display of tobacco products in retail environments*

- 1.4 The FTC Document considers three approaches to further restricting the display of tobacco products in retail environments:
- Do nothing, retain current restrictions, maintaining enforcement of relevant legislation;
  - Regulate point-of-sale display more strictly by further restricting permitted advertising space and/or restricting display space or ways in which tobacco products are displayed; and
  - Require retailers to remove tobacco products from display.

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<sup>1</sup> “Europe Economics” is the trading name of European Economic Research Limited, often hereinafter “we”.

- 1.5 Annex 3 of the FTC Document contains a formal (consultation-stage) impact assessment comparing the first and third of these approaches. It concludes that a display ban would have net benefits of £314.5m-£1.93bn, with a best estimate of £1.09bn.

*“Plain packaging”*

- 1.6 The FTC Document invited “views from stakeholders and members of the public on the potential for plain packaging of tobacco products ... to reduce uptake of smoking, particularly among children and young people”.
- 1.7 The FTC Document clarified what the Department of Health means by “plain packaging” in the following terms:

Plain packaging, also known as generic, standardised or homogeneous packaging, means that the attractive, promotional aspects of tobacco product packages are removed and the appearance of all tobacco packs on the market is standardised. Except for the brand name (which would be required to be written in a standard typeface, colour and size), all other trademarks, logos, colour schemes and graphics would be prohibited. The package itself would be required to be plain coloured (such as white or plain cardboard) and to display only the product content information, consumer information and health warnings required under the law.

- 1.8 Amongst our contentions in this report is that a requirement of this sort is not in fact a plain *packaging* requirement, for a cigarette pack should be understood as both having a continuing independent function in itself and as delivering an integral and inseparable part of what is typically purchased by cigarette consumers.

## **Structure of this Report**

- 1.9 This report assesses, from an economic perspective, the Department of Health’s consideration of display of tobacco products in retail environments and “plain packaging” over the following sections:
- Section 2 draws out some important distinctions between packaging and dispensing, and considers how branding changes the nature of products.
  - Section 3 goes into more detail on the economic role of point-of-sale display, emphasizing the importance of branding imagery and switching.
  - Section 4 considers the role of brands in innovation and the welfare losses that would be associated with the undermining of this role.
  - Section 5 considers the economic theory on the role of brands in market competition and predicts qualitatively the effects of a display ban and a plain packs requirement. The display ban predictions are then compared with the empirical results in other tobacco markets where product has been removed from retail display.
  - Section 6 looks at the trends on smoking prevalence in the UK and in other relevant jurisdictions and whether there is any evidence that display restrictions lead to reduced prevalence.

- Section 7 analyses further effects that might be associated with the policies considered here.
- Section 8 draws upon the analysis of previous sections to critique the consultation-stage impact assessment.

1.10 There then follows two appendices.

## **Summary of the Report's Findings**

- 1) Cigarette packs are a product in themselves, not the mere packaging of a product.
- 2) Branding changes the nature of products.
- 3) Visibility at point-of-sale of branding imagery is central to consumer discovery of the nature of products and consumers discovering their own preferences between products.
- 4) A branded product communicates its nature to its actual and potential consumers.<sup>2</sup>
- 5) It is not required, for switching between products to be important to market functioning, and to act to the benefit of consumers in general, that most consumers switch. In many markets competition is dependent upon switching by consumers at the margin.
- 6) Innovation is an important source of enhanced consumer welfare.<sup>3</sup> Regulations that undermine innovation can be even more destructive of consumer welfare than regulations that undermine competition.
- 7) The tobacco industry includes much recent and plausible future innovation, including in dispensing design and other features of packs themselves; in cigarette design; and in tobacco production methods — including examples such as slide-out packs, graphite filters, and fair traded tobacco.
- 8) A display ban would materially impair new innovation. A plain packs requirement would probably all-but end product innovation in the tobacco sector.
- 9) The impact upon innovation of the display bans introduced recently in Iceland and Thailand is as yet unclear.
- 10) Because of the key roles of visible branding at point-of-sale to informed consumer choice and the discovery of new products, both a display ban and a plain packs requirement

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<sup>2</sup> By “actual and potential consumers” here we mean to include both those that have previously purchased the particular product and those that have not previously purchased this particular product. We make no comment here, and have not considered, the population from which, in practice, potential consumers of any specific product are drawn. Hereafter we shall use the term “potential consumers” of a product unqualified, but always reflecting the amplification in this footnote.

<sup>3</sup> See paragraphs 4.3ff for the definition of the economic term “consumer welfare”.

should be expected to have negative competition effects. A plain packs requirement might be expected to have more extreme effects, perhaps even including effective crystallisation of the market.

- 11) Evidence from Iceland and Thailand suggests that the theory understates the significance of a display ban. Our interpretation is that a display ban, as well as having negative competition effects itself, may also be bringing to realisation a number of the negative competition effects of other measures (e.g. restrictions on advertising).
- 12) The UK tobacco sector, which is already quite concentrated, appears to rely for competition (a) primarily upon rivalry between Imperial and JTI/Gallaher, (b) through threats from BAT and Philip Morris, and (c) upon a market environment including a number of niche brands. Evidence from Iceland and Thailand suggests that the UK might suffer material negative competition effects from a display ban and/or a plain packs requirement, and this should be borne in mind by regulatory authorities before coming to a decision on these regulatory initiatives.
- 13) Data from Iceland, Thailand and relevant Canadian provinces all suggest that, at least so far, display bans have had no measurable impact upon prevalence of smoking, either among the young or among the population as a whole.
- 14) Particularly if a display ban and/or a plain packs requirement led to an increase in counterfeiting and/or contraband, there could be negative impacts on UK tobacco industry employment and upon the UK tax take from tobacco.
- 15) The FTC Document contains a consultation-stage impact assessment on the proposed display ban which wrongly (in our view, based on the analysis and evidence presented in this report) concludes that competition impacts would be limited.

## **2 PACKAGING, FUNCTIONAL PACKS AND BRANDS**

2.1 In this section we shall propose that:

- (a) a cigarette pack should be understood, as both having a continuing independent function in itself and as delivering an integral and inseparable part of what is typically purchased by cigarette consumers;
- (b) branding changes the nature of a product.

### **Cigarette Packs and Packaging**

2.2 Many products come in packaging. For example, a computer may come in a cardboard box, with bubble wrap and polystyrene foam. This packaging is discarded in order that the product can be used. In terms of the use of the product I have little interest in whether the cardboard box was brown or white. Other products come in packaging that is stored when the product is not in use — think, for example, of a box for a chess set. In that case I have more interest in the nature of the packaging, but it is still “packaging” in the sense that its only function is storage.

2.3 In contrast, other products come in dispensing cases. Think, for example, of a box of artificial sweeteners, where one presses a button on the top in order to dispense just one or two drops of sweetener. For such products, the packet or case is not a mere storage device in which the product is kept when in the store or perhaps at home. Rather, it serves independent functional purposes — carriage and dispensing — at which it might be better or worse. The packet is not mere packaging in which the good is sold. It is itself a good.

2.4 In the case of cigarettes this can be appreciated further when one remembers older practices for carrying and dispensing cigarettes. Think of the silver cigarette case, for example. Cigarette cases at one time had their own separate market. More recently, cigarette manufacturers produced their own, sturdy, often colourful cases with interesting artwork. In addition to different aesthetic features, there are a variety of different functional natures of a packet, reflecting differing consumer needs and tastes. Examples of cigarette packets can be seen in Figure 2.1 below. Some ways in which packets have met differing consumer needs and tastes are:

- (a) The most common cigarette pack in the UK is hard cardboard in a rectangular prism packet with a flip-up lid and the cigarettes fitting inside in two layers.
- (b) Another packet type has the cigarettes arranged in one layer.
- (c) In another packet type there is no flip top, but the packet is opened by sliding out a drawer.
- (d) Many cigars are dispensed in metal tins, rather than cardboard packets.
- (e) In many countries cigarettes are sold in softer packets more suited to someone carrying cigarettes in a trouser pocket.

- (f) Some packets that may be used in darker conditions (e.g. at certain kinds of party) are fluorescent.

**Figure 2.1: Examples of Cigarette Packets**



- 2.5 Thus, when a consumer purchases a packet of cigarettes, there is a bundle of two goods being bought.
- 2.6 That the role of the packet is not mere packaging can be seen even further by reflecting upon what *is* packaging of packet-cigarettes bundles. For example, cigarette packets generally come wrapped in plastic; similarly, a purchase of a multi-pack carton, e.g. in a duty free shop, may involve paper wrapping.

**How a Branded Product is Different from an Unbranded Product**

- 2.7 Brands differ from one another, and branding alters the economic nature of a product. This can be seen most clearly if we explore the distinction between branded and unbranded products.
- 2.8 Brands serve many economic functions. Setting aside for now how the branding is acquired or expressed, two physically identical goods, one with a brand and one without, are not the same product. Having a brand changes the economic nature of a product in a fundamental way.
- 2.9 We shall explore in later sections the significance of the functions of brands to competition and innovation in tobacco markets. For now, however, we shall explain below why the effects of branding are sufficiently significant to mean that branded product is not the same product as an unbranded product. Indeed, in other contexts a sufficiently powerful



brand can be enough that the branded product is regarded for competition purposes as its own market.

- 2.10 Suppose that you purchased an unbranded set of batteries. Now compare that with batteries purchased from a well known and recognised battery brand, such as Duracell, for example. Typically the presence of the brand would provide you with reassurance that the batteries would actually power your electronic device, that the device would not be corrupted in any way by these batteries, and that the device would be powered for a reasonable amount of time. This in turn means, for example, that if you are a music lover who likes to pass train journeys by listening to your pocket mp3 player and you purchase the branded batteries prior to a train journey; then you can have confidence that your preferred means of passing the train journey will be possible. Even if, as it turned out, the unbranded batteries were physically precisely the same as the branded batteries, made using the same materials and by the same production processes, it would still not have been the same thing that you bought.
- 2.11 Again, suppose, for example, that you were considering replacing an old Goodyear tyre on your car with an unbranded tyre. Now contrast that with a new Goodyear tyre. Even if, as it turned out, the tyres were physically precisely the same, made using the same materials in precisely the same way, it would clearly not be the case that the unbranded and the Goodyear tyres are the same product. With the branded (i.e. Goodyear) product you would probably, for example, be more certain that the tyre would actually have been made from appropriate rubber, instead of merely looking like a rubber tyre or being made from some inferior rubber that would wear down very quickly and need to be replaced. You would also be more confident that your tyre would have tread that meets the standard required for your car to be legal to drive — that it met the statutory requirements for legal tyres.
- 2.12 Without, in this section, going into the economic detail of *how* a brand delivers these functions, it is clear that a brand *does* do this. A product without a brand is not the same as a product with a brand.
- 2.13 A plain packs requirement, in combination with existing advertising bans in the UK, would strip away everything other than the name of the brand. There would remain the name,<sup>4</sup> of course, but without any means to express a brand the nature of the product purchased would have been changed profoundly — in a sense, it would have become a different product. In the short term, people might perhaps remember the previous pack design, and the name might evoke memories of this branding (though the scale even of this would be uncertain, and one plausible result, as discussed further in later sections, would be to entrench the position of products that already have a large market share and undermine new innovations, creating dominance and related competition issues), but eventually instead of branded cigarette packs, as we now understand them, all that would

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<sup>4</sup> "written in a standard typeface, colour and size" (FTC Document paragraph 3.64)

be on sale would be, as it were, pieces of tobacco wrapped in paper with a filter in a cardboard container.

## **Conclusion**

- 2.14 A plain packs requirement would be the banning of a set of products. The products banned would be many functionally useful varieties of cigarette packet and the branded bundle that consists of such packets and the cigarettes they contain.

### **3 POINT-OF-SALE VISIBILITY AND SWITCHING**

- 3.1 In this section we consider further the role that branding imagery plays, focusing particularly on its role at the point-of-sale. Our key contention will be that branding imagery (*cf* the plain packs idea) and point-of-sale visibility play a key role in enabling a consumer to make informed purchasing decisions.

#### **The Role of Brand Imagery at Point-of-Sale**

- 3.2 When we see a bowl of soup with steam coming off, we infer that the soup is hot. The shiny skin of an apple tells us that the skin is taut and hence the apple likely to be crispy. A blue-footed booby — the sea bird from, most notably, the Galapagos islands — uses its foot colour to signal its actual reproductive quality to potential mates.<sup>5</sup> Fruits use their colours to communicate to birds their content of anti-oxidants.<sup>6</sup> In the same way, the branding of products is a device by which those products communicate with actual and potential consumers.
- 3.3 Point-of-sale visibility is crucial to the ability of a product to communicate with a consumer before purchase. Most consumer products can come in a number of slightly different forms, and consumers differ in their preferences between these. Branding imagery is a key device by which the product communicates its nature to consumers, allowing them to discover that the product matches their (self-known) niche tastes. For example, the Smirnoff range includes plain vodka, vodka with citrus flavour, with raspberry flavour, and orange flavour, amongst others. As can be seen in Figure 3.1 colour and images are central to the efficient communication of these different product niches. Even if we could not read, did not have our reading glasses, were looking at a distance, were in a hurry and did not have time to read, we would know all-but-immediately which vodka was going to be plain and which have a flavour (from the twist-bottle), and which of the flavoured would be citrus flavoured, which raspberry flavoured, and which orange flavoured, just from the bottle shape, colour and imagery.

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<sup>5</sup> See <http://cat.inist.fr/?aModele=afficheN&cpsid=18093281>.

<sup>6</sup> See <http://www.ingentaconnect.com/content/bsc/fecol/2008/00000022/00000002/art00015> for more details of this phenomenon. Note that this is an honest signal, and that the foot's colour is not under the control of the booby in the same sense that the foot's movements are.

Figure 3.1: Four varieties of Smirnoff



- 3.4 As well as branding allowing products to communicate to consumers that their characteristics match preferences of which consumers are aware, branding is also important to consumers *discovering* their own preferences between products.<sup>7</sup> I might enter the shop knowing that I wanted a bottle of plain vodka, but it was only when I saw the pictures of the citrus, the raspberry and the orange that I realised that what I actually wanted today was raspberry flavoured vodka. This reflects the Hayekian concept that a market is a preference discovery mechanism. Without branding, consumers would probably become more bound by what they had tried in the past, and more random if they trialled new products at all — with the trying out of new products often leading to disappointment, thereby reducing the tendency for consumers to try out new products at all.
- 3.5 Imagine if all Smirnoff products had to come in identical packaging. People would sometimes end up buying products they didn't want, by mistake, and new types of Smirnoff vodka would be less likely to be sampled. Even if they did have branding imagery, if Smirnoff products could not be displayed, but had to be hidden away and asked for specifically, consumers would often be unsure what they wanted.
- 3.6 Thus, brands, visible at point-of-sale, allow products to communicate their nature to consumers, assist consumers in discovering their own preferences between products, and facilitate consumer trialling.

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<sup>7</sup> Note that this includes both discovering preferences between brands and discovering preferences between branded and unbranded product. For example, it may be only when I see a cup of branded Costa coffee that I realise how much more I am prepared to pay for it than for an unbranded coffee in the shop next door.

## **Switching at Point-of-Sale**

3.7 The FTC Document states (paragraph 3.38):

The tobacco industry is concerned that a ban on the display of tobacco products in retail environments could restrict trade by making it difficult for brands or products to be promoted. While these concerns are recognised, evidence shows that most smokers make up their minds about which brand of tobacco they will buy long before they reach the shop, with less than 3% of tobacco-purchasing customers deciding to change brand at the point of sale.

3.8 The FTC Document's interpretation appears to be that a figure of less than 3 per cent point-of-sale brand switching is lower than that typical of other products, and thus insignificant. We are unclear on what basis the FTC Document takes this view. Given the roles of brands — for example, the importance of repeat purchasing and brand loyalty — it is entirely unsurprising that most consumers do not switch regularly. But in all markets (including FMCG markets), competition is determined at the margin, typically with only a minority of consumers switching.

3.9 One should also bear in mind that the number choosing to switch brand at point-of-sale is not necessarily the same as the number that become aware of alternative brands at the point-of-sale.

3.10 A further thing to emphasize is that all consumers benefit as a result of switching by only a minority.<sup>8</sup> Consider the following narrative example. There was a town in which there was just one established shop in which to buy milk. The milk cost £1 per pint, it was only possible to buy it in pint cartons, and sometimes it went off very quickly after people took it home. People often complained, but the owners of the shop never did anything about it — after all, where else were their customers going to buy their milk?

3.11 One day a new shop opened, offering cartons of milk at the same price but of more reliable quality. Some people that used to buy from the old shop started switching to buying their milk at this new venue. Clearly these people were made better off by the extra available choice — they got better quality milk for the same price as before.

3.12 That evening the owners of the original shop reflected upon their day's takings. They were upset to lose the revenue from their former customers, and were concerned about losing more custom. So when the shop opened the next day they cut their prices a little, so that they were lower than at the other shop. Furthermore, they started being more careful about how their milk was stored, so that it didn't go off. Over time, they also started thinking about ways they might attract back customers of the other shop — they

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<sup>8</sup> We acknowledge here that the example to illustrate this point would need to be more complicated in a setting involving perfect segmentation, but set that complexity aside for now. We also acknowledge the obvious fact that people make the decision to switch at other times than at the point-of-sale, but this does not detract from the force of the example that follows.

thought they might offer milk in different sized cartons, perhaps some in two-pint cartons, and some in six-pint cartons.

- 3.13 So after a while, even those that stayed with the established shop were better off — their prices were lower; the quality was higher; and over time there were new innovations.
- 3.14 This is how competition works. The availability of alternative choices creates competitive pressure on providers to reduce their prices and increase their quality, *even for those customers that do not switch*. Over the longer term it also stimulates innovation, so that those that do not switch will benefit from new product options from the same supplier.
- 3.15 Thus, it is not required, for switching to be important to market functioning, that most consumers switch regularly. We shall consider competition in more detail in Section 5. But before then we shall turn to the roles of branding in enabling, facilitating and expressing innovation.

## **4 BRANDS AND INNOVATION EFFECTS**

4.1 Economists have long recognised the importance of innovation, as well as the importance of competitive markets, in securing maximum welfare gains to consumers and producers. In this section we consider the welfare losses that might be associated with the process of innovation being undermined in the UK tobacco market. Because brands are key to the process of innovation, as explained below, the measures considered by the Department of Health, by materially damaging or even (in the case of plain packs) effectively eliminating brands, threaten to undermine the process of innovation.

### *What is meant by innovation*

4.2 Economists understand innovation to mean the search for, and the discovery, development, improvement, adoption, and commercialisation of new processes, new products, and new organisational structures and procedures. This can take the form of process innovations, which is to say cost reducing technologies, or product innovations, which are technologies for producing new products.<sup>9</sup>

### *Innovation and welfare*

4.3 Social welfare as defined by economists is usually calculated by summing “consumer surplus” and “producer surplus”. Each consumer’s “surplus” is defined as the difference between what she would have been willing to pay for a product and what she actually did pay — also sometimes call the consumer’s “gains from trade”. Consumer “welfare” is then typically conceived of as the sum across consumers of their individual surpluses. Producer surplus typically refers to the aggregate profits firms make in a specific market. Economic theory demonstrates that the more competitive and contestable<sup>10</sup> markets are, the more effective they are at securing welfare gains.

4.4 Furthermore, economists are not only concerned with ensuring that markets are as competitive as possible. It is recognised that innovation can also, and independently of competition, secure welfare gains for producers and consumers. Even markets that are not particularly competitive in their structure, taking a monopolistic or oligopolistic form, for example, can generate welfare increases through innovation.

4.5 It is recognised that regulation that undermines innovation can be even more destructive of consumer welfare than regulation that damages competition.

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<sup>9</sup> See, for example, Oz Shy, *Industrial Organization, Theory and Applications*, (1995), pp. 221/222

<sup>10</sup> A “contestable” market is one in which, even if there is only one firm, the threat of a new firm entering the market is sufficient to keep the market operating at the competitive equilibrium. Such markets are of particular interest in an innovation context, as sometimes the threat of a new innovation is sufficient to make a market in there is only one current player contestable.

## **The Role of Brands in Innovation**

- 4.6 Brands, especially when protected by intellectual property rights, increase firms' incentives to innovate. Moreover, the presence of brand loyalty generally allows firms (e.g. FMCG manufacturers) to achieve more rapid market penetration for new products. The overall effect of brands is to stimulate a virtuous innovation cycle.
- 4.7 This cycle operates in terms of product innovation, as opposed to process innovation (which has its own independent significance but will not be considered here), and can be seen in developments in the UK tobacco market over time.

## **Innovations in the Tobacco Market**

### **Standard forms of innovation**

- 4.8 The tobacco industry has produced various innovations in both tobacco and packaging over recent years. Silk Cut Graphite is an example of tobacco product innovation. The Benson & Hedges Silver "Push2Slide" pack, the Camel Sparks Limited Edition pack, and the Lucky Strike X pack are examples of packet innovation. Let us examine a few innovations in more detail.

### *Verification of Genuine Product Technology*

- 4.9 JTI and the other major cigarette manufacturers in the UK have implemented a new security feature for individual cigarette packs as part of the Verification of Genuine Product Scheme. This may constitute an innovation of value to the company and regulatory authorities concerned with minimising counterfeit cigarettes alike.

### *Silk Cut Graphite*

- 4.10 Silk Cut Graphite provides a dual carbon filter, a feature which other cigarettes on the UK market do not have.

**Figure 4.1: Silk Cut Graphite**



### *Dunhill "100% Additive-Free Tobacco"*

- 4.11 The packaging for this product identifies it as being "100% ADDITIVE-FREE TOBACCO". It is expressed as being "simply a blend of the world's finest tobacco. No additives – just authentic taste...".



**Figure 4.2: Dunhill 100% Additive-Free Tobacco**



*Benson & Hedges Silver "Push2Slide" pack*

4.12 In 2006, Benson & Hedges Silver introduced a side-opening pack with a slide-out drawer.

**Figure 4.3: B&H Silver Slide**



*Silk Cut Purple bevel edged pack*

4.13 This pack features rounded edges.

**Figure 4.4: The Silk Cut Purple bevel edged pack**



*Camel Sparks Limited Edition pack*

4.14 The "Camel Sparks Limited Edition Pack", which features a blue 'firework' motif (as illustrated below), was released as a limited edition pack. The pack was designed so that the pack's firework motif 'lights up' under UV light, providing a new dimension to the pack for its consumers.

**Figure 4.5: Camel Sparks**



*Lucky Strike X Pack*

- 4.15 In December 2007, BAT released the Lucky Strike X Pack in the EU. It was described as an innovative packet, with two parts assembled in an X-shape, which opens right and left like a book, showing four different interior faces.

**Figure 4.6: Lucky Strike X Pack**



- 4.16 Many of these innovations involve new ways to employ the pack itself.

**“Ethical consumption” innovations, and their dependence upon branding imagery**

- 4.17 Many other forms of innovation would be reliant upon pack imagery to convey their nature to consumers. For example, in many markets, today, consumers are taking an increasing interest in issues of “ethical consumption.” Many standard forms of ethical consumption could be applied, very naturally, to cigarettes. However, they would depend upon the use of the appropriate kite-marking artwork, colours and logos. Clearly the use of such artwork would be prohibited by a plain packs requirement, making these forms of ethical

consumption innovation commercially impractical. Even a display ban would make it much less likely that consumers would become aware of the arrival of such products, considerably reducing the incentives of manufacturers to engage in these forms of innovation. There follow some examples, and exploration of how they would depend upon visible artwork.

### *Fair Trade Cigarettes*

- 4.18 The Fairtrade Foundation was established in the UK in 1992, with the first products to carry the FAIRTRADE Mark launched in 1994. The FAIRTRADE Mark is a registered certification label for products sourced from producers in developing countries. For a product to display the FAIRTRADE Mark it must meet international Fairtrade standards, which are set by the international certification body Fairtrade Labelling Organisations International (FLO). In the case of cigarettes, Fairtrade standards would relate, for example, to the salaries and working conditions of those picking and processing tobacco.

**Figure 4.7: The FAIRTRADE Mark**



- 4.19 The FAIRTRADE Mark has become an increasingly prominent feature in UK shops and, although no current tobacco product carries the Fairtrade Foundation mark itself (because no fair trade standards have yet been set by the Foundation for tobacco products), it seems plausible that there could be demand for a cigarette packet with the FAIRTRADE Mark on it. The Fairtrade Foundation has been quoted as saying that “the criteria against which it would be measured would be the same as for sugar, tea, cocoa or cotton; whether there were enough small holders growing the product and whether those farmers were receiving a premium price”.<sup>11</sup> Some independent firms (e.g. Akwesasne Mohawk Trading LLC, with the “1st-nation” brand) have already attempted to establish their own independent fair traded tobacco standards.<sup>12</sup>
- 4.20 Clearly, if a plain packs requirement were implemented then products would be unable to communicate to consumers that their production had had this innovative feature. Even a display ban would severely impair the ability of consumers to be aware of the nature of these products. As a straightforward example, the “1st-nation” brand does not currently feature the FAIRTRADE Mark, notwithstanding its claim to be ethically sourced. With a display ban, consumers would not be able to observe that there were no FAIRTRADE Marks on these cigarettes.

Figure 4.8: 1st-nation cigarette packs



*Cigarettes using less carbon emissions in manufacture and transport*

4.21 The Carbon Trust issues carbon reduction labels to provide a measure of a product's carbon footprint (embodied GHG emissions) across its life cycle. This label is said to allow a business to demonstrate its commitment to manage and reduce the carbon emissions of its product, as well as helping consumers make more informed decisions about the products that they buy. Environmental issues are of increasing concern and focus for consumers, businesses and policy-makers alike but if the plain packs proposal was implemented then tobacco manufacturers would be unable to demonstrate such a commitment via the Carbon Trust label or any other similar branding, and a display ban would restrict the ability of cigarette manufacturers to launch such a product.

Figure 4.9: The Carbon Trust logo



*Cigarettes with organically grown tobacco*

4.22 The Soil Association is the UK's leading certification organisation for organic food and farming. Its organic symbol is a widely recognised trademark for organic produce and is found on more than 70 percent of all UK organic produce. The symbol provides reassurance to consumers that the produce marked is certified to high organic standards — allowing consumers to have comfort concerning the environmental impact of producing the products they consume. It seems plausible that a tobacco producer could meet (or at least seek to meet) the standards required to have their produce branded with this

<sup>11</sup> See <http://www.guardian.co.uk/environment/ethicalivingblog/2007/nov/07/abrandofcigarettesthat>

<sup>12</sup> See <http://peopleandplanet.org/havid6039>

certification or similar but plain packs and display restrictions mean that these products would be unable to communicate or limited in communicating the innovation contained in having met these standards and so, this innovation would be unlikely under such restrictions.

**Figure 4.10: The logo certifying that produce is farmed organically**



## **Predicted Impacts of Branding Expression Restrictions upon Innovation**

### *Display ban*

- 4.23 The expected effects of a display ban would depend upon the nature of the market before the restrictions were imposed.
- 4.24 First, consider a market in which brands had been operational for some time, discharging the functions discussed in Sections 3 and 4, such that the key market niches were filled. In that case, following the restriction, it would become difficult for new brands to enter the market, and the growth in new brand families or varieties would be expected to decrease.
- 4.25 On the other hand, in a market in which brands did not, before the restrictions, occupy all market niches that were well-known from other countries — perhaps a market that had previously been subject to competition restrictions, or even just a market in which natural market dynamics favoured products seeking to compete across the broad span of the market rather than in specialist niches<sup>13</sup> — in such a case, following the restriction, if the result were to create the possibility of establishing a dominant position in a market niche, the restriction might be followed by a period of rapid introduction of brand varieties known from other markets in an attempt to be first into these market niches. This might mean that there would be a period of expansion in brand varieties, which, as we shall see below, would mean that on certain ways to measure “innovation” there would be an apparent period of raised measured innovation. However, once the market had stabilised with all well-known niches filled, we would expect the rate of measured innovation to fall away.

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<sup>13</sup> This might be the case, for example, in a market in which the considerable majority (let us imagine 80 per cent, just to make the discussion concrete) of consumers were similar, in which there were large economies of scale in production, and in which the tastes of the residual (20 per cent, say) consumers were little different from the main block. In such a case it might be natural for niches not to have specialist service.

*Plain packs*

- 4.26 Clearly a plain packs requirement would make pack innovation impossible — and, as we have seen, pack innovation represents an active class of innovation in this industry.
- 4.27 A plain packs requirement would, in addition, be expected to have a much more clearly marked effect than a display ban in reducing innovation in tobacco products. Whilst a display ban would make it difficult for new products to communicate their nature to consumers, a plain packs requirement (in combination with established restrictions on advertising) would make this all-but impossible.

### **Empirical Evidence on Innovation from other Tobacco Markets**

- 4.28 Since the predicted short-term impacts of a display ban are ambiguous, and it is only over the longer term that innovation impairment would be clearly visible, it would be difficult to draw any definitive conclusions on the basis of data without a long data series to observe.
- 4.29 A plain packs requirement has not been adopted in any other jurisdiction. Therefore, beyond the obvious point that pack innovation would be ruled out altogether, it is impossible to quantitatively assess the potential impact of the plain packs measure upon innovation.
- 4.30 In contrast, display bans have been introduced previously in a number of jurisdictions:
- (a) In Iceland the Tobacco Control Act (No. 6/2002), including **advertising and display bans**, took effect on 1 August 2001.
  - (b) In Thailand, product was removed from display at the point-of-sale following the Tobacco Product Distribution Guidelines which took effect on 24 September 2005 (“the Guidelines”).
  - (c) In Canada display bans have been introduced in a number of provinces:
    - ⇒ The province of Manitoba enforced a display ban on 15 August 2005.
    - ⇒ In the province of Saskatchewan, a display ban was enforced on 19 January 2005.<sup>14</sup>

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<sup>14</sup> The display ban entered into force on 11 March 2002. However, the display ban was declared inoperative as a result of a ruling of the Court of Appeal for Saskatchewan on 3 October 2003. The Supreme Court of Canada reinstated the display ban on 19 January 2005. During the period between 3 October 2003 and 19 January 2005, during which time the display ban was not enforced, the Canadian Council for Tobacco Control notes that “about half of retailers continued to comply” (see <http://www.cctc.ca/cctc/EN/powerwalls/faq>).

- ⇒ In British Columbia, similar restrictions have only been enforced since 31 March 2008 and therefore in principle it might be used as a placebo (control) sample.

4.31 We shall often hereafter refer to these as the Relevant Dates.

4.32 With the possible exception of Iceland, these are very short time series to expect the medium- to long-term effects to be visible. Furthermore, there are missing data problems with the Canadian data that significantly reduce their usefulness for this purpose. We shall therefore now report our empirical findings in respect of Iceland and Thailand, with Canada excluded because the dataset is incomplete and statistically inadequate.

### **Defining “innovation”**

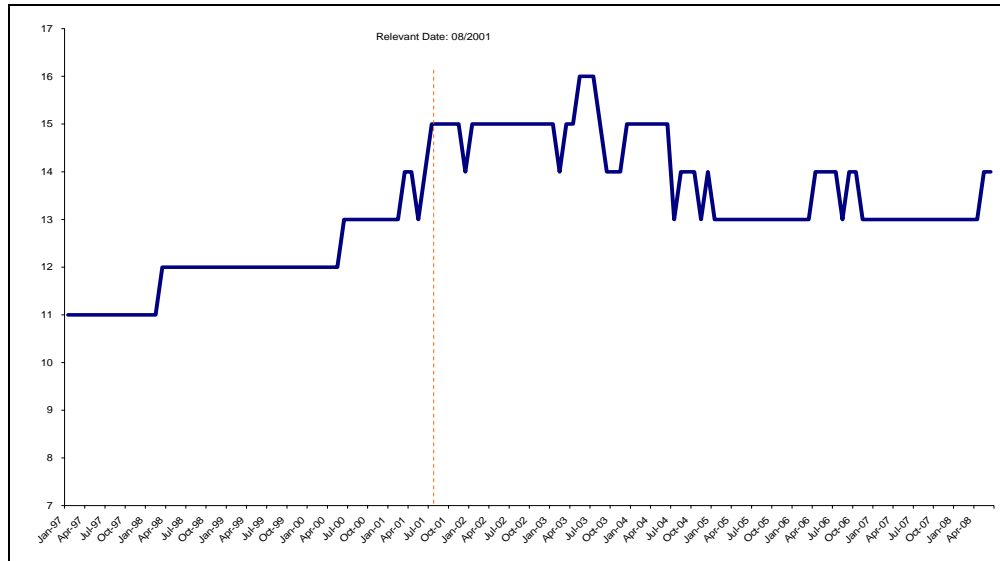
4.33 Providing a definition of innovation which is comprehensive and which allows, at the same time, precise quantification is extremely difficult. Given that the goal of this section is to consider the impact that the tobacco regulations being considered might have on product innovation, we use the number of brands present in the market as a measure of product innovation.

4.34 (In the empirical analysis that follows we employ the term “brand” at the level of brand family — so, Camel Filters Ksf Soft, Camel Filters Ksf Box, Camel Lights Box, Camel Regular Soft, Camel Full Flavor Box are, in our graphs, one “brand” on the Icelandic market. This is not quite the same concept of branding that we employ in the discussion earlier, where the term is closer to what we in the empirical analysis call “brand varieties”.)

### **Iceland and Thailand**

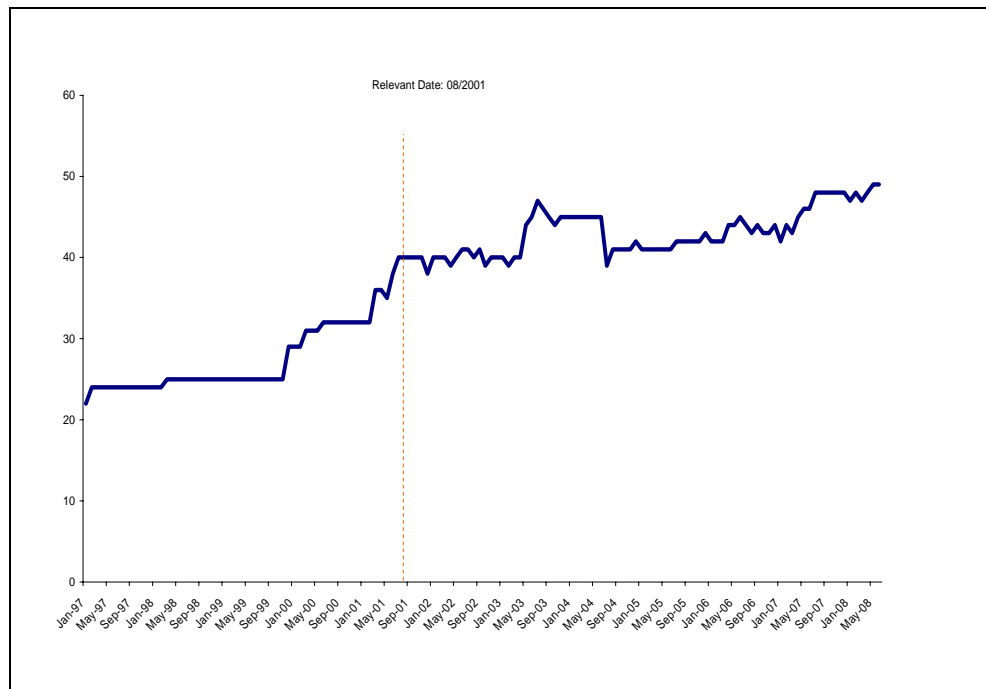
4.35 We graph the numbers of brands and brand varieties in Iceland in Figure 4.11 and Figure 4.12. The dashed line represents the relevant date of the display ban as explained in paragraph 4.30. It is possible that we see here that the number of brands and varieties was growing fairly rapidly in the run-up to the introduction of the measure (perhaps reflecting liberalisation of the market), and that after the measure the rate of growth slows. However, the dataset is very limited here, and we do not feel that these data are adequate for a definitive statement.

**Figure 4.11: Number of cigarette brands in Iceland**



Source: ÁTVR (State Alcohol and Tobacco Store) in Iceland

**Figure 4.12: Number of cigarette brand varieties in Iceland**

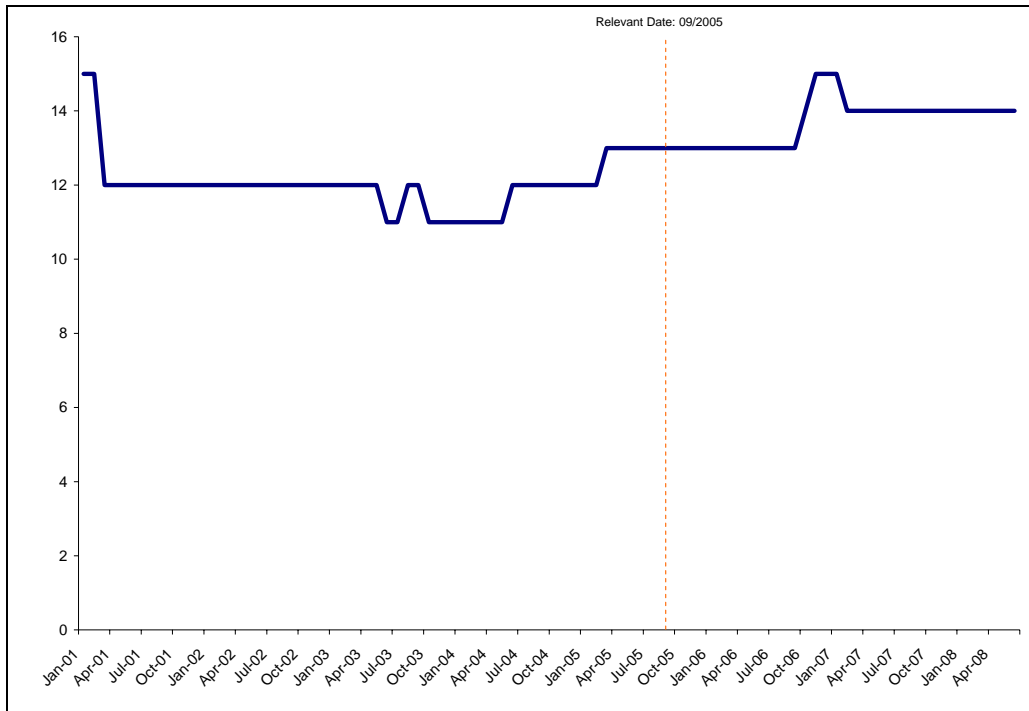


Source: ÁTVR (State Alcohol and Tobacco Store) in Iceland



4.36 Similarly, in the case of Thailand, we see little change at around the time of the measure's introduction. Again, it is difficult to know how to interpret this.

**Figure 4.13: Number of cigarette brands in Thailand**



Source: AC Nielsen

4.37 Brand varieties data are not available for Thailand.

4.38 Overall, our assessment is that the evidence on brands from other jurisdictions is, as yet, inconclusive. This is unsurprising given the short timescale, and does not challenge our view that, over the long term, it is natural to assume that there would be some effects of a display ban in terms of reduced innovation. And, of course, as we have argued, the effects of a plain packs requirement would be much more profound.

## 5 COMPETITION EFFECTS OF BRANDS

- 5.1 This section sets out some of the economic theory of the role of brands in the process of market competition, and draws on that theory plus the material of previous sections here to produce predicted competition impacts, from a theoretical perspective, of a display ban and of a plain packs requirement. It moves on to compare the theoretical prediction for the display ban case with quantitative evidence from other tobacco markets where measures in respect of brand display, similar to those considered for the UK, have previously been implemented.
- 5.2 This quantitative evidence supports the prediction of economic theory that restrictions on the use of brands will tend to damage competition. Hobbled competition reduces consumer welfare, as generally understood by economists in terms of "consumer surplus".<sup>15</sup> This should be of concern to policymakers with an interest in competition issues.
- 5.3 A plain packs requirement, in combination with existing advertising bans in the UK, would effectively destroy branding. A display ban would reduce the expression of brands at point-of-sale. We shall see that a display ban would be expected to lead to more limited versions of some but not all of the effects of a plain packs requirement. We shall also see that in places where products have been removed from display, the quantitative effects match the negative competition predictions of this section — indeed, the negative competition effects are perhaps more marked than one might have anticipated by considering (from a theoretical perspective) a display ban in isolation, perhaps indicating that a display ban brings to realisation some of the negative competition effects of other tobacco control measures. This is often the case with regulation — the final straw has a greater competition and market entry effect than its weight alone might suggest.<sup>16</sup>

### Functions of Brands in the Competition between Existing Products

- 5.4 In this section we consider various functions of brands most relevant to competition between existing products that are additional to the preference discovery, switching and innovation functions already covered in previous sections.

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<sup>15</sup> See paragraph 4.3.

<sup>16</sup> One example, used in seminars on the concepts and techniques of policy impact assessments that Europe Economics gives regularly to staff at the communications industry regulator Ofcom, is of regulation of television advertising of high - sugar - high - fat foods to children. In itself, such a ban might have little effect - there would be many other forms of marketing that could take its place. However, the proposed measures are part of a package of policies that in combination may have an important impact. Similar issues are explored in a report by Europe Economics to the European Commission (DG Enterprise and Industry) providing an impact assessment of proposals to relax controls on the types of information that pharmaceutical companies are allowed to provide to patients (this report is to be published shortly by the Commission). This study shows how a given change in the legal constraints would be expected to have a greater or lesser effect, depending on the details of the enforcement regime.

*Brands facilitate product variety*

5.5 The vodka example above<sup>17</sup> is an illustration of brands facilitating greater variety and, therefore, choice. The more choice that consumers have the more likely they are to be able to find a match for their particular tastes, and the more precisely they are able to understand what their own tastes are. Also having increased choice acts as a vehicle towards increased consumer power in the market, driving efficiency and other improvements.

*Brands allow the Market to address various potential market function problems*

5.6 Brands are a device by which the Market solves certain problems that might otherwise lead to market imperfections. For example, the well-established economic situation called “asymmetric information” arises principally because firms are often better informed than consumers about certain detailed characteristics of products that consumers find difficult to observe directly. If I buy a second-hand car, for example, I will know less than the seller about how likely the car is to break down. Again, in the case of the battery example discussed above, the person selling the battery knows much better than the purchaser how long it is likely to last.

5.7 We have already discussed (pp 3.2ff) how brands allow products to communicate better their characteristics to consumers. This addresses the problem above directly, by reducing the asymmetry. But of course not all information asymmetry can be eliminated in this way. So the Market addresses these problems in two other key connected ways:

(a) by allowing individual consumers to enhance their understanding of products through repeated purchasing;

(b) by allowing even those that have not tried a particular product themselves to find out — e.g. by word of mouth — about its characteristics from other consumers.

5.8 Brands are central to each of these. If products are simply commoditised (i.e. perceived by consumers as identical, in the way of commodities such as wheat or copper), then each individual firm has limited incentives to achieve high quality (say — if that is the dimension of information asymmetry) because by doing so that will not make consumers more likely to buy that firm’s products again any more than those of other firms. And similarly if no-one can identify a product with a good or bad wider reputation beyond its current consumers.

5.9 Brands allow reputation to be built up and stored through repeated purchase of a specific product. The experience of repeated purchase allows consumers:

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<sup>17</sup> See paragraphs 3.2ff.

- to better learn their preference and increase their product awareness; and
- to be more credible and effective in communicating their purchasing experiences to other consumers — allowing consumers as a group to learn more fully about products and their suppliers than would typically be possible for any one consumer.

*Brands facilitate market entry*

5.10 Brands decrease barriers to entry to the market because they represent a channel by which products can signal their nature to existing consumers. In the absence of branding new potential products would be deprived of the possibility of making their nature visible to consumers, which, ultimately, would impair the ability of firms to enter new markets — their only realistic mechanism for doing this would be via the purchase of existing brands.

*Brand identification markets*

5.11 Brands allow the existence of brand identification markets — i.e. markets for products such as Rolex or Police, in which the brand itself is a key part of what is being purchased and in which the manufacturers of those goods employ techniques to control their image — for example, by paying for celebrity endorsements (e.g. David Beckham endorsing Police sunglasses). These markets, like markets for luxury goods, are characterized by the fact that consumers value manufactured goods not only for their tangible features but also for how they allow identification with the brand.<sup>18</sup>

## **Predicted Impacts**

### **Market functioning effects**

5.12 Our discussion thus far has been at the level of theory. Later in this section we shall consider some empirical evidence from jurisdictions in which display restrictions have been introduced in recent years. Based upon the discussion above concerning the economic functions of brands, we would expect the competition impacts of both the proposed display ban and a plain packs requirement to be:

- Reduced competition; and
- Increased concentration.

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<sup>18</sup> We emphasize that the feature of brands raised in this paragraph is distinct from that in 5.7 and 5.9. Of course, celebrities might be amongst the consumers of a product that discuss its features with others, but the key to a brand identification market is that manufacturers control celebrity endorsements and advertising to achieve specific image objectives. Thus, for example, many people know certain of the schools to which certain politicians sent their children, and that may tell us something about those establishments, but the schools were not paying for the politician's endorsement, and so this belongs to consumer communication, not brand identification. Similarly, doubtless some celebrities are known to be smokers of certain brands, but since tobacco manufacturers have no direct control over which celebrities like which brand, this again belongs to consumer communication.

- 5.13 In addition, there would be loss of consumer welfare through less accurate preference matching (consumer mistakes) and less switching (less attempt to match niche preferences to niche products).
- 5.14 The negative consumer impacts would be very difficult to observe, by their nature, but the impacts on firms should be more straightforward — analysis of degrees of competition is common and widespread and subject to standard techniques.
- 5.15 The competition impacts would differ between firms depending upon the extent to which they have already established their market position and depending upon the nature of their business model. Firms for which their business model depends upon the use of diversity so as to appeal to niche tastes and firms that are currently seeking to enhance their market position by winning market share from the leading firms stand to suffer more than a firm relying on one dominant brand — indeed, the latter may gain (in these terms) because it will still take benefit from being known as the market leader and will be subject to less competitive pressure from other firms.
- 5.16 A plain packs requirement would damage tobacco brands more than a display ban. In principle, plain packs could even lead to the crystallisation of market shares, whereby “crystallisation” we mean that the competitive process would be so completely undermined that market shares would become (more-or-less) completely fixed. We note, however, that even with plain packs literal crystallisation would be unlikely. More probable is that the market would move materially towards this state, to a “crystallisation for practical purposes”. Such crystallisation would leave consumers largely captive to specific products, increasing market power and reducing the scope for new entry and/or innovation, as discussed above.
- 5.17 To summarize the position here:
- (a) We believe that the most extreme market evolution scenario it is reasonable to posit would be a crystallisation for practical purposes, not occurring in the short term but occurring in the medium term. In practice this would mean that market concentration stabilised in a very narrow band and the market lost almost all its dynamism — so, concentration would vary little through time — with perhaps a long-term downward trend in concentration as the vested position of well-established brands very gradually faded away. Perhaps, in the very long term, something like “commoditisation” would occur whereby all cigarettes within particular groupings (e.g. tar content) came eventually to be regarded as perfect substitutes. Our view is that theory suggests this as a very unlikely scenario to be associated with a display ban, and even with a plain packs requirement it should be considered unlikely though not altogether ruled out.
  - (b) A more plausible scenario for plain packs is that the dynamics of concentration are very noticeably impaired (as opposed to largely eliminated), with materially greater market power of well-established brands and loss of competitive position for firms that depend upon innovation or brand proliferation (addressing many niches).

- (c) We would emphasize that, overall, our view is that the negative competition effects of a plain packs requirement would be noticeable and material, but the lost innovation associated with a plain packs requirement (probably the total loss of most innovation in the sector) in combination with greater consumer confusion at the point-of-sale (and hence reduced consumer surplus from trade) would be even greater.
- (d) As regards a display ban, we would consider it a surprise if such a ban were indeed to result in crystallisation. However, that notwithstanding, we do believe that a display ban should be expected to have some impact upon competition, particularly by limiting switching at point-of-sale. This should be expected to enhance market power of established brands. We would probably not expect to witness such an effect immediately upon the introduction of a display ban, but it would become more marked over time.
- (e) In this case, the negative innovation effects would obviously be materially less than those of a plain packs requirement (e.g. it would not be that certain innovation would be banned). Probably some innovation would still occur, but probably not enough to provide a material contestability threat<sup>19</sup> to established brands. Thus, our view is that it is plausible, in the case of a display ban, that the main effect of reduced innovation would be loss of effective competition in the market.

### **Effects on counterfeiting and contraband**

- 5.18 It is natural to suppose that a plain packs measure would lead to increased incidence of counterfeit cigarettes, because it would become much less expensive to duplicate cigarette packs. In addition, there might be a niche market for product that had the outward appearance of the pre-plain-packs-requirement product, and in the absence of genuine branded product for comparison, it might be difficult for consumers to distinguish counterfeits from genuine versions of the branded product (e.g. product purchased in duty free and sold on).
- 5.19 The effect of a display ban would presumably be less than that of a plain packs measure, but might nonetheless be material. At present presumably even quite minor visual flaws in a counterfeit product become obvious if it sits visibly amidst genuine product. But if visibility were reduced, so genuine and counterfeit product would not sit next to each other for easy comparison, counterfeiting standards would not need to be so high to go unnoticed.
- 5.20 Contraband might also increase with a plain packs requirement, with illegal imports from jurisdictions that did not have plain packs. This might be more attractive than today, because such imports could be sold at a premium price because of their branding and logos.

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<sup>19</sup> A "contestability threat" is simply the threat present in a contestable market. See footnote 10.

- 5.21 If counterfeiting and contraband were indeed to increase, that would reduce output by legitimate manufacturers and reduce the UK government's tax take.

### Price effects

#### *Plain packs*

- 5.22 Very probably, at least following an initial period in which there would presumably be transition costs associated with the move to a plain packs manufacturing regime, costs for cigarette manufacturers would ultimately tend to fall, as they would no longer be spending the same money on branding.
- 5.23 Whether there would therefore be falls in the cost of a pack compared with a situation without a plain packs requirement would depend on the interplay between reduced competitive pressure (tending to raise prices) and increased focus on pricing (tending to reduce prices) and reduced manufacturing costs (again tending to reduce prices). We have not, at this stage, attempted to model which of these effects would dominate. However, in the UK context in which it appears that there are price differentials of as much as £1.50 for premium products over low-end product, a natural scenario might be
- (a) Rapid falls in the prices of premium product after a plain packs requirement is introduced (as costs fell and consumer willingness to pay fell, notwithstanding the ongoing presence of the brand name<sup>20</sup>);
  - (b) Price stabilisation later, as ongoing competitive pressures are reduced.
- 5.24 Overall, the result would probably be lower prices in the short- to medium-term (as the effects of the loss of premium product differentials were lost), but perhaps higher prices over the long term (as market power and loss of innovation effects began to predominate). If counterfeit and contraband were to increase from what are, for contraband at least, already extraordinarily high levels (estimates range from some 8 to 27 per cent<sup>21</sup>) that might well limit the scope for tax rises to offset these price falls.

#### *Display ban*

- 5.25 A display ban would probably leave existing premium products in relatively secure market positions. Indeed, their market power might well increase because of the reduced tendency of consumers to switch (they would not observe alternatives, as discussed in Section 3). New innovation would also be more difficult, as discussed in Section 4.

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<sup>20</sup> See paragraph 2.7ff.

<sup>21</sup> For the 8 per cent figure see FTC Document paragraph 2.29, where it is stated "The Government's latest estimate is that the illicit share of the tobacco market in the UK is between 8 and 18%.". For the 27 per cent figure see *UK Tobacco Facts — April 2008*, UK Tobacco Manufacturers' Association.

5.26 In combination then, in this case the likely result is price rises for established product, relative to its counterfactual price path (what would have happened without the display ban). In contrast, less established product may need to be sold at heavy discounts, so as to attract potential consumers by standing out on the price list and so as to compensate consumers for the risk that they will dislike an innovation the characteristics of which they are most unsure about (for they lack adequate brand communication).

## Empirical Results of Removing Packs from Display in Other Countries

5.27 We have conducted a series of empirical investigations to assess the possible impact that tobacco regulations have on competition, based on display bans introduced in other jurisdictions in recent years, as set out in paragraph 4.30. The countries we have selected are Iceland and Thailand, as both countries have witnessed the removal of pack display at the point-of-sale in recent years.

5.28 If we were to find that these measures (more limited in scope than those in the FTC Document given that the FTC Document also includes discussion of a plain packs measure as a possible future regulatory initiative) had an undesirable impact on market competition, lessons might be drawn for what to expect if a display ban were introduced in the UK. And, of course, a plain packs requirement would be expected to have even greater effects.

5.29 The standard economic approach to quantifying the degree of competition in the market is to calculate the Herfindahl-Hirschman index (HHI) value for that market. The HHI is calculated by squaring the market share of each firm competing in the market and summing the resulting numbers. The HHI takes into account the relative size and distribution of the firms in a market and approaches zero when a market consists of a large number of firms of relatively equal size. The HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases. Formally, if there are  $N$  firms operating in a market, HHI is defined as:

$$HHI = 10,000 \sum_{i=1}^N s_i^2, \text{ where } s_i \text{ denotes the market share of firm } i$$

5.30 HHI values over 1,800 are widely regarded as indicating highly concentrated markets, whilst figures above 1,000 but below 1,800 indicate moderate concentration, and figures below 1,000 indicate relatively low concentration. In the UK, stress is also placed upon market structure, as well as firms' conduct and performance, in market or merger investigations. Thus, while these thresholds are useful reference points, they do need to be viewed in context.

5.31 In what follows we have not attempted to engage in a strict market definition exercise, of the sort that would be appropriate in a competition or economic regulation exercise. Instead, hereafter we often use the term market in the general economic sense of geographic markets. So, when we use terms such as "limited competition" or "high concentration", they should be understood in a looser sense than would be employed in a



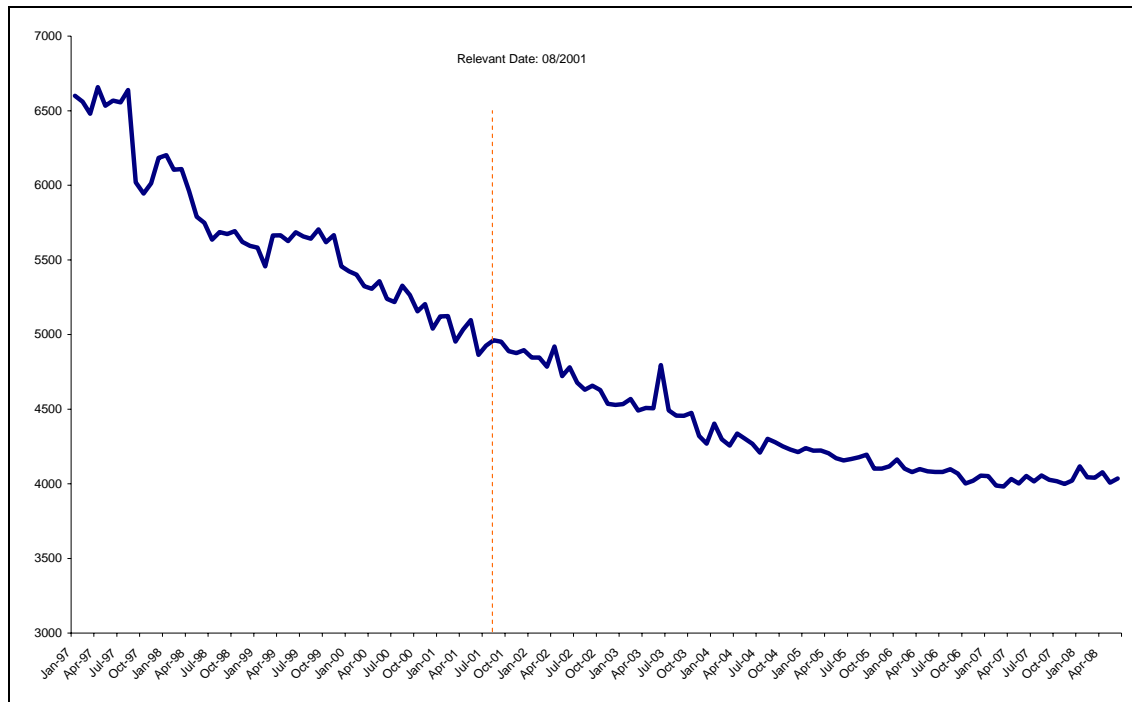
formal competition assessment setting. Nonetheless, we believe that the analysis that follows does provide useful insight into the path of competition in these jurisdictions and the effect of a display ban thereon.

5.32 Subject to these important caveats, in the graphs below, in broad terms, a downward slope indicates reducing concentration as measured by the HHI, and hence increasing competition. An upward slope indicates reducing competition. And a flat line indicates neither increasing nor reducing competition.

### Iceland

5.33 Figure 5.1 displays the HHI for the Icelandic market.

**Figure 5.1: Herfindahl-Hirschman index of cigarette manufacturers the brands of which are sold in Iceland**



Source: ÁTVR (State Alcohol and Tobacco Store) in Iceland

5.34 From a visual inspection of the graph above we can see that:

- While throughout the period, the Icelandic market was highly concentrated (i.e. the HHI is above 1,800 — we note again that we have not conducted a market definition exercise, so our comments relate to the general competitiveness of the sector, rather than the question of dominance or otherwise in any one “relevant market” for competition purposes), competition increased steadily up to November 2001. After February 2003, however, the increase has been only marginal. Moreover, late in the

period the HHI has stabilized close to the value of 4,000, suggesting the end of any dynamic competitive process in the market.

(b) Similarly the variations in the HHI are significantly more marked in the early period of the series while in later periods these variations become negligible. This is indicative of higher fluctuations of firms' market shares (and thus a more dynamic competition) in the pre-2001 period compared to the post-2001 period.

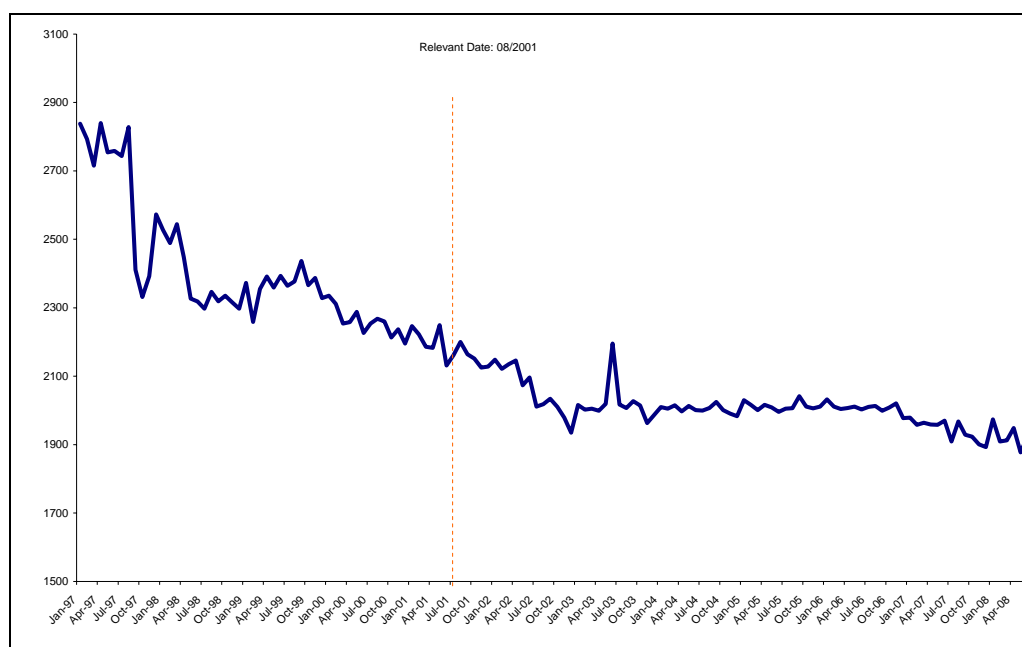
5.35 Though these visual observations have their own importance, it is useful to test their statistical robustness more formally. We have tested the claims above statistically by specifying a model for the entire series and testing for a structural break. (The statistical test involved is called a "Chow" test. This is a well-established and internationally-recognised procedure. It works by taking the statistically best model of the overall series and then estimating the equation specified by that model separately for the period before and after suspected breaks in the series to see whether there are significant differences in the equations estimated for those two periods. A statistically significant difference indicates a structural change in the relationship.) We have found that the series displays a break after the introduction of the Icelandic regulation, and that the effect of regulation has been that of "freezing" significantly the competitive forces in the market.<sup>22</sup>

5.36 The analysis in Figure 5.1 concerned competition in Iceland between manufacturers, the brands of which are sold there. Much the same results arise if, instead, we analyse using an HHI constructed from the market shares of different cigarettes producer's brands. When calculated in this way, the HHI represents the brand concentration in the market (as opposed to producers' concentration) so that a high value of the index implies that a few brands have a large share of total consumers.

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<sup>22</sup> We refer the reader to Appendix II for a technical explanation of the methodology used.

**Figure 5.2: Herfindahl-Hirschman index of cigarette brands in Iceland**

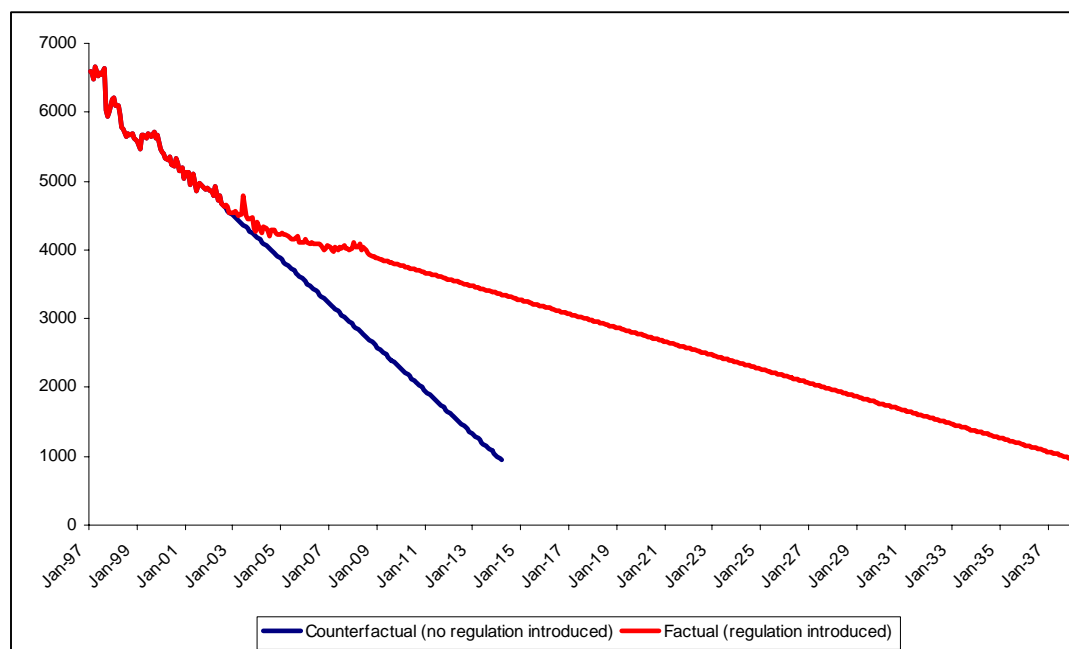


Source: ÁTVR (State Alcohol and Tobacco Store) in Iceland

- 5.37 As Figure 5.2 illustrates, cigarette brand concentration is generally lower than that of cigarette producers. This is as expected, since, in almost every product market, the number of brands is larger than the number of manufacturers (it is much rarer for two manufacturers to produce the same brand than for one manufacturer to produce two brands), and consequently, the value of the HHI calculated with brands' shares tends to underestimate the actual effective degree of concentration (which is usually thought to depend more on the manufacturer market shares).
- 5.38 What is however interesting to notice in Figure 5.2 is that the break in the series pattern is even more marked than in Figure 5.1. Whilst brand concentration gradually decreased during the first five years of the sample, brand market shares almost completely crystallized in the later period. This has also been tested statistically by applying the same method used for the previous series (see Appendix I for details).
- 5.39 To get a more concrete sense of what the costs of this relative crystallisation mean, we modelled the effect in terms of the number of additional years of limited market competition. (The reader should note that this illustration is intended merely to vivify/make concrete the wider discussion, and note the caveats in paragraph 5.31.) The specific results were that the cost of regulation, in competition terms, has been 23 additional years of limited market competition. Prior to the introduction of the regulation, the trend in Iceland would have delivered a competitive cigarettes market by 2014. Now the market is no longer projected to become competitive until 2037.

5.40 Figure 5.3 (drawn from Appendix II) illustrates the result. The blue line represents the trend before the relevant Icelandic regulation was introduced. The red line represents the actual path of the HHI up to 2008 and the future trend thereafter. This graph also illustrates one version of the statistical test involved (the Chow test). This test establishes that, indeed, the trend before the date of the display restriction is statistically significantly different from that after the restriction. The graph shows that an HHI of 1,000 (the threshold for a competitive market) would have been reached in 2014 on the blue pre-restriction line, but takes until 2037 to reach the same value on the red post-restriction line.<sup>23</sup>

**Figure 5.3: Simulation of the increase in competition in the absence of a display restriction**



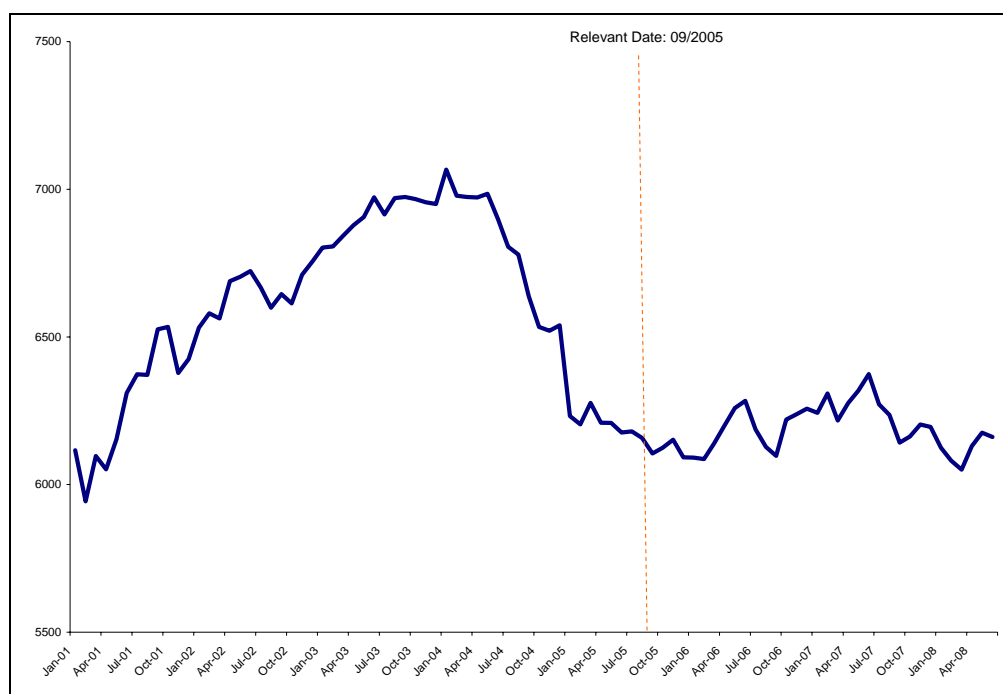
Source: Europe Economics analysis of ÁTVR (State Alcohol and Tobacco Store) in Iceland

### Thailand

5.41 We repeated the analysis for Thailand. The HHI of cigarettes manufacturers and cigarettes brands are depicted in Figure 5.4 and Figure 5.5.

<sup>23</sup> See Appendix II for further details.

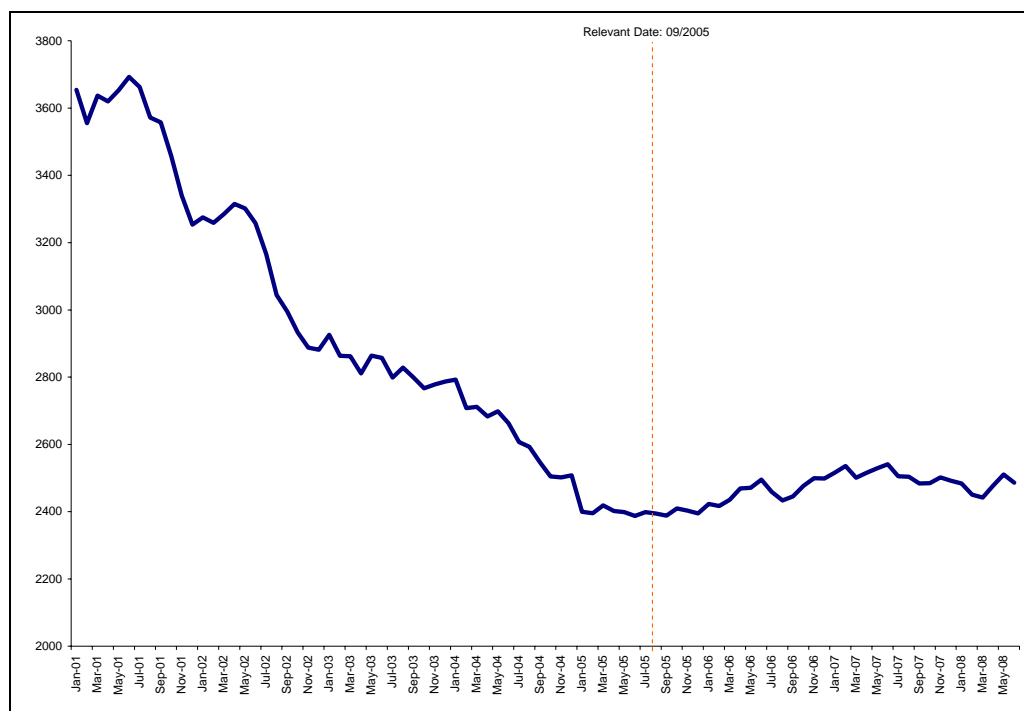
**Figure 5.4: Herfindahl-Hirschman index of cigarette manufacturers the brands of which are sold in Thailand**



Source: AC Nielsen

- 5.42 The Thailand market witnessed an increase in concentration between January 2001 and January 2004. This was driven by a gradual increase in the share of TTM, the market leader. Later, Philip Morris started gradually to erode TTM's market share. As a consequence the concentration index decreased, very steeply at first (up to February 2005), and more smoothly thereafter (in the period February 2005 – February 2006). From February 2006 the concentration index has been oscillating and no trend is observable.
- 5.43 The behaviour of the brand concentration is different. As depicted in Figure 5.5, the brand HHI decreased steadily for 5 years (January 2001 – January 2005), including in the period where the manufacturer concentration increased. However, as with the manufacturer concentration, brands concentration loses any trend in the later period, stabilising around a constant value (2,500 in this case).

**Figure 5.5: Herfindahl-Hirschman index of cigarette brands in Thailand**



Source: AC Nielsen

- 5.44 Thus, visual inspection suggests that market concentration stabilizes after the Guidelines. This “crystallization” is more marked in the case of cigarette brand market shares than in the case of manufacturer market shares.
- 5.45 Unlike the case of Iceland, we have not been able to support these conclusions from visual inspection with a formal statistical test. The technical reasons for this are explained in the Appendix.<sup>24</sup>

### Comparing the Empirical Results to the Predictions

- 5.46 Our prediction was for some negative competition impacts of a display ban. We stated that we did not expect these to arise immediately upon the introduction of the ban, and that it would be a surprise to observe crystallisation.
- 5.47 The evidence from Iceland and Thailand runs against our empirical predictions. The negative competition effects from a display ban appear to arise much more immediately

<sup>24</sup> For the sake of completeness we note here that statistical analysis of the series in Figure 5.4 and Figure 5.5 leads us to conclude that they behave as *random walk* and, because of this they cannot technically be subject to the kind of test we have performed for Iceland.

than we anticipated, and to be much more marked, indeed creating something akin to effective crystallisation for practical purposes. We consider this result a surprise that requires an explanation.

- 5.48 Clearly one possibility is that other events the effects of which we have not modelled are also contributing in Iceland and Thailand. However, the fact that a fairly similar picture emerges in both jurisdictions means that, though we suspect there must be some contribution of this sort (as we say, the overall result is a surprise to us), it is unlikely that this constitutes the whole story and it seems likely that, indeed, the display ban has a more marked impact upon competition than we had expected.
- 5.49 The explanation, we suspect, is that the display ban brings to realisation a number of negative competition effects from other tobacco control measures. This is often the way with regulation. Many individual regulations in other sectors, for example, create small barriers to entry and add a little to the costs of small firms. Then a modest additional measure, analysed by itself, might be expected not to lead to large exit or significantly reduced new entry. But suddenly a cost threshold is exceeded by the introduction of this one further modest measure — the final straw breaks the market's back.<sup>25</sup>
- 5.50 In this case it was not that we thought the display ban a trivial or even modest measure in itself — our view was that the impacts should be expected to be material. But it may be, perhaps, that a display ban *in combination with other advertising restrictions* has meant that, in Iceland and Thailand, consumers have just lost all practical ability to compare brands.
- 5.51 We believe that further study of these data would certainly be warranted by any regulatory authority responsible for tobacco control in another jurisdiction with an interest in not disproportionately reducing competition.

## The UK

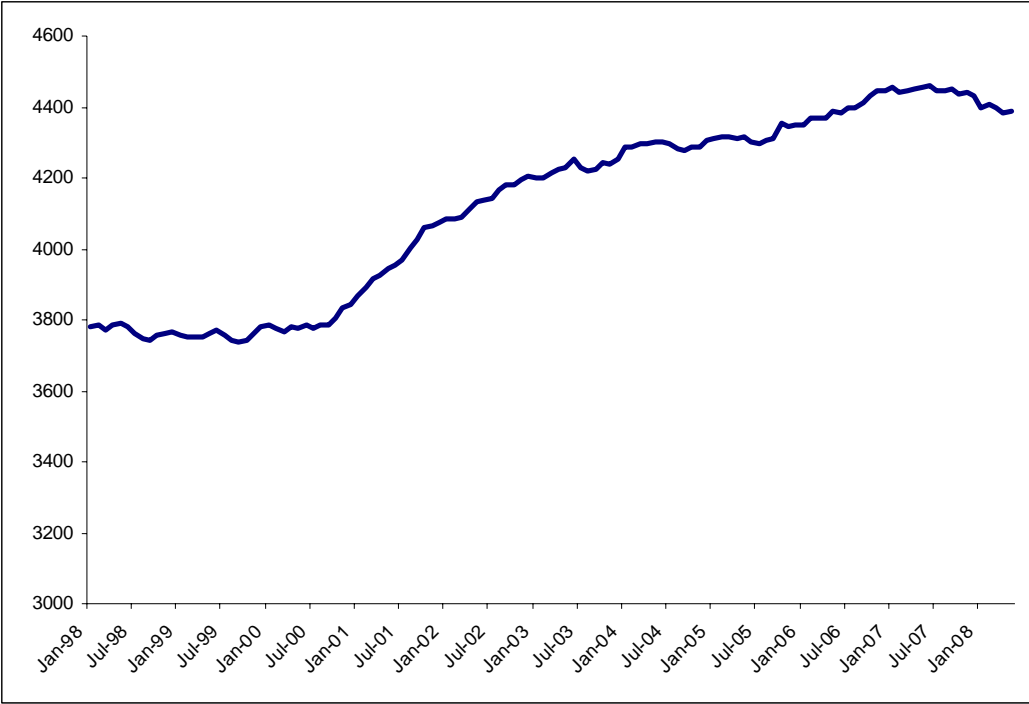
- 5.52 In light of these conclusions we stress the importance of considering the possible competition consequences that the introduction of a display ban, and potentially to a materially greater extent, the introduction of plain packs, could have in the UK. The UK tobacco sector is relatively concentrated (together JTI/Gallaher and Imperial have more than 80 per cent sales share between them) and concentration has increased steadily over the past 10 years (see Figure 5.6, Figure 5.7).<sup>26</sup>

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<sup>25</sup> Please see footnote 16 for further discussion and illustration of this point.

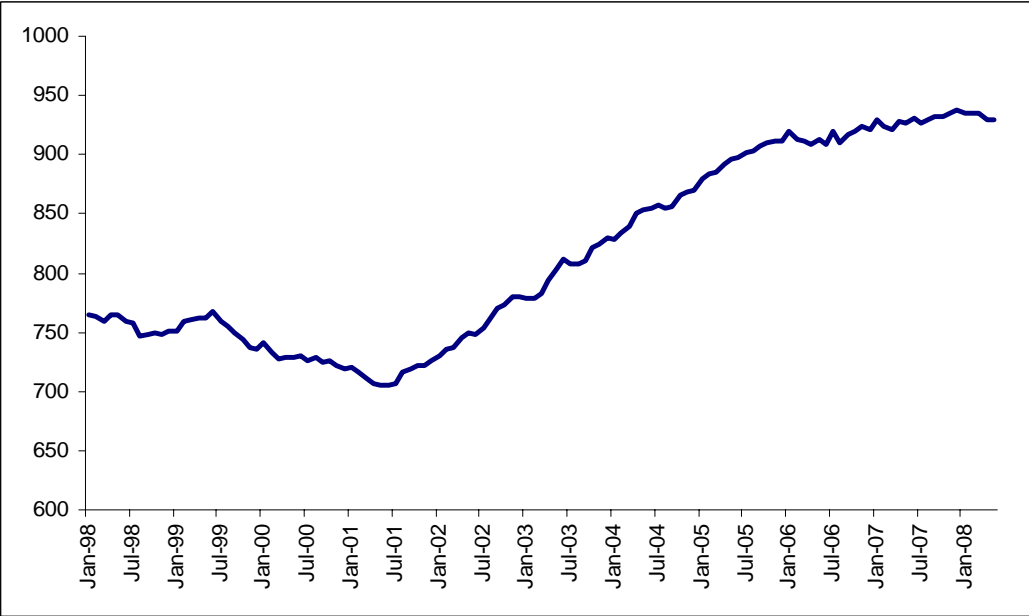
<sup>26</sup> A point about this to note, in passing, is that it provides reassurance that neither the falling concentration in Iceland nor the up-down concentration in Thailand were simply reflective of global trends.

Figure 5.6: Herfindahl-Hirschman index of cigarette manufacturers in UK



Source: AC Nielsen

Figure 5.7: Herfindahl-Hirschman index of cigarettes brands in UK



Source: AC Nielsen



- 5.53 There are obviously complexities relating to distinctions between premium and low-end product and other niches, but at a high level, competition appears to depend upon rivalry between JTI/Gallaher, Imperial Tobacco, and potential and actual threats such as that from Philip Morris and BAT. See Table 5.1 and Table 5.2.

**Table 5.1: Market shares of cigarette manufacturers at May 2008**

Manufacturer	Market Share
Imperial	45.5%
JTI/Gallaher	39.1%
Philip Morris	7.6%
BAT	6.0%
Wholesaler Own Labels	1.1%
Retailer Own Labels	0.7%

Source: AC Nielsen (adjusted — the 7.6 per cent Philip Morris figure is, we understand, distributed in the UK by Imperial and therefore appears under Imperial in the AC Nielsen data.)

**Table 5.2: Market shares of most popular cigarette brands at May 2008**

Cigarette Brand	Manufacturer	Market Share
Lambert & Butler	Imperial	15.9%
Richmond	Imperial	14.7%
Mayfair	JTI/Gallaher	14.1%
Benson & Hedges	JTI/Gallaher	9.4%
Marlboro	PMI	7.3%
Silk Cut	JTI/Gallaher	5.1%
Sterling	JTI/Gallaher	4.6%
Superkings	Imperial	4.5%
Royals	BAT	3.9%
Embassy	Imperial	3.1%
Windsor Blue	Imperial	3.1%
Regal	Imperial	2.8%
Sovereign	JTI/Gallaher	2.0%
Berkeley	JTI/Gallaher	1.7%
John Player Special	Imperial	1.2%
Pall Mall	BAT	1.0%
Dorchester	JTI/Gallaher	0.8%
Retailer Own Label Cigarettes		0.7%

Source: AC Nielsen

- 5.54 It thus appears likely that competition in the UK market relies primarily upon rivalry between Imperial and JTI/Gallaher, through threats from BAT and Philip Morris, and in a

market environment including a number of niche brands — a situation vulnerable, in competition terms, to the effects of a display ban or a plain packs requirement.

- 5.55 The evidence from Iceland and Thailand (perhaps surprisingly) suggests that a display ban can lead to quite significant stabilisation in market shares at the pre-ban level, with market dynamics largely disappearing. If indeed this were to be borne out in the UK case, then in addition to the loss of innovation discussed in Section 4, competitive pressures could be materially reduced.
- 5.56 We repeat that we would expect a plain packs requirement to have even more negative competition and innovation impacts than a display ban.

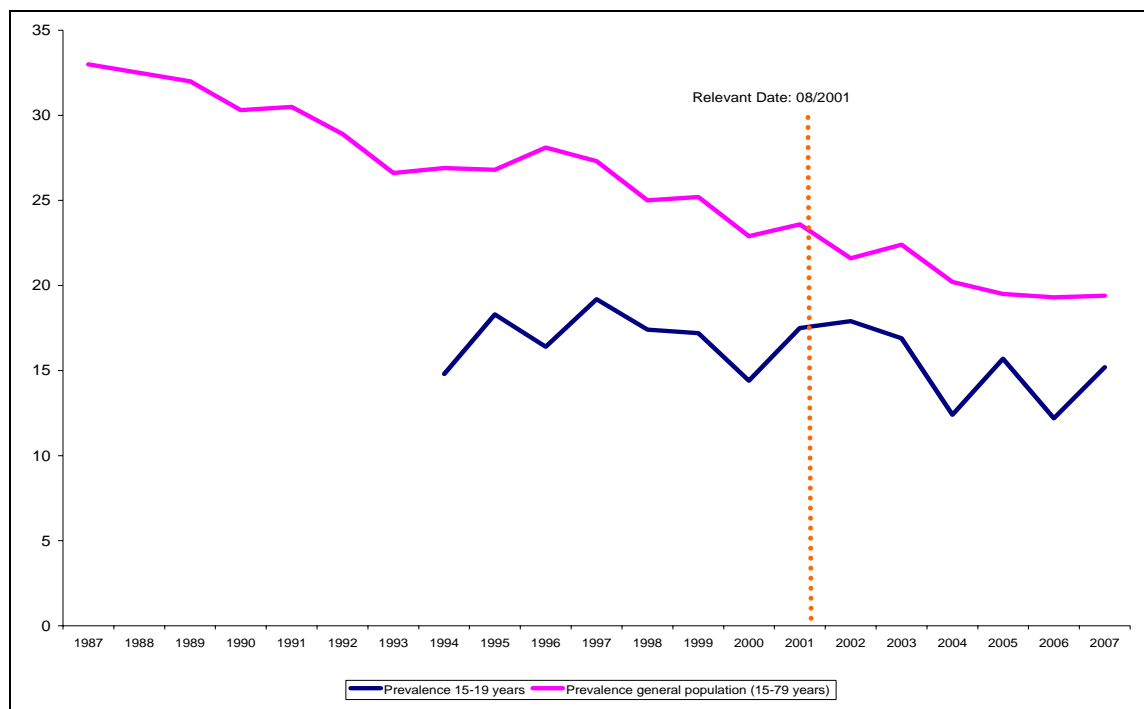
## 6 IMPACT ON SMOKING PREVALENCE

6.1 In most western countries smoking prevalence has decreased in recent decades. It appears that the intention of the measures considered in the FTC Document, loosely put, would be to increase the speed at which smoking prevalence (for the whole population in the case of display, and for youth smoking in the case of plain packs) is decreasing in the UK.<sup>27</sup>

### Evidence from Other Jurisdictions

#### Iceland

Figure 6.1: Percentage of people that are daily smokers in Iceland



Source: Statistics Iceland based on survey undertaken by the Public Health Institute of Iceland

6.2 Smoking prevalence amongst the general population in Iceland in Figure 6.1 more clearly displays a downward trend over time than amongst those aged 15 to 19 years. Upon visual inspection the display ban would not seem to have caused a structural break in

<sup>27</sup> It should be noted that this analysis is based upon consideration of legitimately purchased cigarettes. It may be, as we consider elsewhere, that a display ban and the plain packs measure are associated with increased counterfeit and contraband cigarettes. It could also be that a different picture of cigarette consumption emerges when counterfeit and contraband cigarette consumption are also taken into account. Sadly, available data does not allow us to do this properly but this possibility should be acknowledged.

either of these series. Thus, the policy would seem not to have impacted upon these prevalence trends.

6.3 Unfortunately, the number of data points in these series is insufficient to perform a Chow test and better establish that these series do not contain structural breaks. Nonetheless, the number of data points in both series is more than double the number in the series cited in the FTC Document.

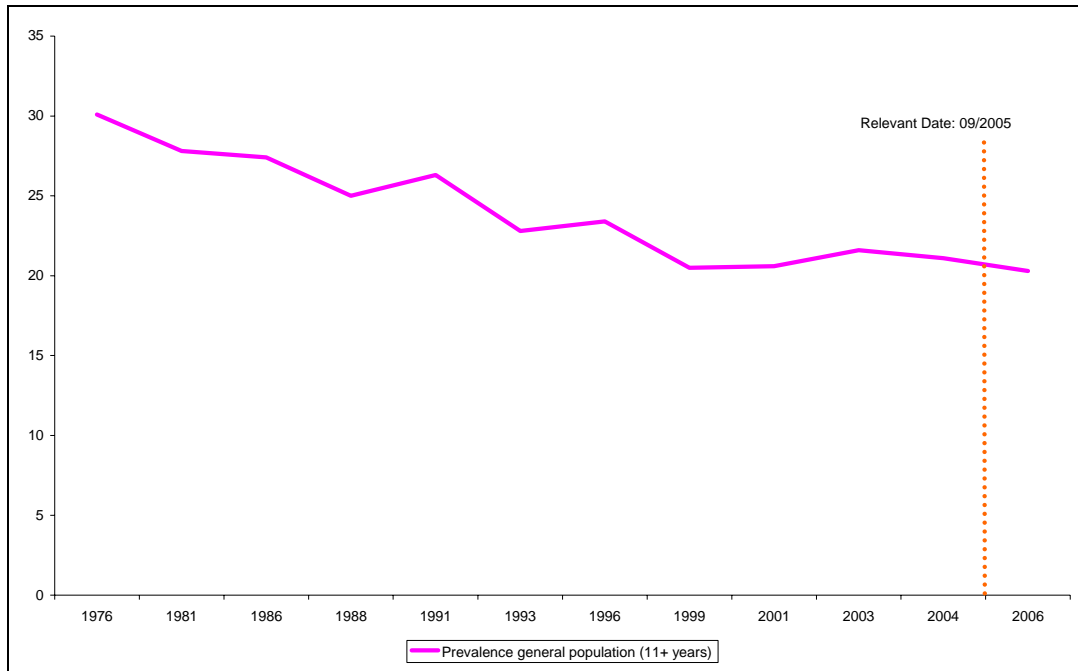
6.4 The FTC Document states (paragraph 3.29):

While the evidence about the impact of the display ban in Iceland, introduced in 2001, is not definitive, it does point to the potential benefit in reducing prevalence among young people. The number of 16–17 year olds who had smoked in the last 30 days was 32% in 1995 (six years prior to the implementation of the display ban), 28% in 1999 and 20% in 2003. When asked if they had ever smoked cigarettes, the percentage of 16–17 year olds who reported that they had fell from 61% in 1995 to 46% in 2003.

6.5 We see no basis upon which to claim that the European School Survey Project on Alcohol and Drugs (ESPAD) data the FTC Document relies upon in this quoted paragraph provides a more reliable statistical picture than that provided by Statistics Iceland. Indeed, it would certainly be inappropriate to draw strong conclusions on the basis of only three data points. For the same reason, we do not find the FTC Document's reference to the reported fall in the number of 16-17 year olds who have ever smoked cigarettes from 61 percent in 1995 to 46 percent in 2003 to be conclusive. In neither of these cases is there consideration of whether these changes might be reflective of a pre-existing trend from prior to the display ban. Furthermore, we can see from the Statistics Iceland data that the series for 15-19 year olds is subject to considerable volatility. As an illustration of the dangers of picking just three years from a series of this sort, we note that the number of 15–19 year olds who were daily smokers was 14.8 per cent in 1994, 14.4 per cent in 2000, and 17.9 per cent in 2002, after the enforcement of the display ban.

## Thailand

**Figure 6.2: Percentage of people that are daily smokers in Thailand**



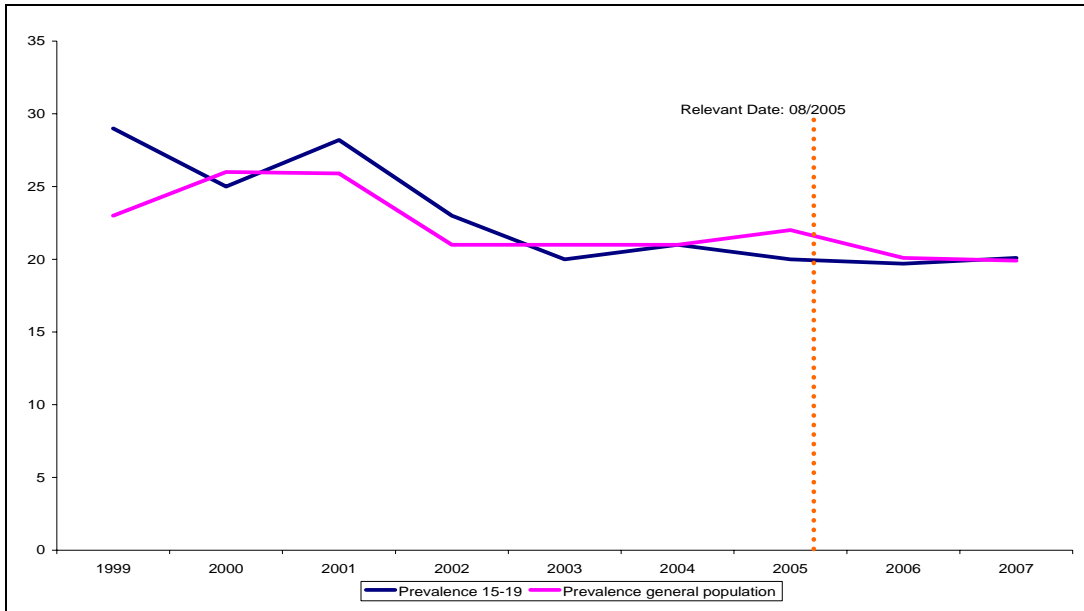
Source: The Thailand Health Profile 2005-2007 is prepared by the Bureau of Policy and Strategy, Ministry of Public Health (the Bureau). The Bureau sources this information from Health and Welfare Surveys and the Preliminary Results of the Survey of the Population's Tobacco and Liquor Consumption 2001, both of which are carried out by the National Statistical Office

6.6 The trend on percentage of daily smokers in Thailand in Figure 6.2 is downwards but data points after the Relevant Dates are insufficient for anything to be concluded on the impact of the display ban upon prevalence.

## Canadian Provinces

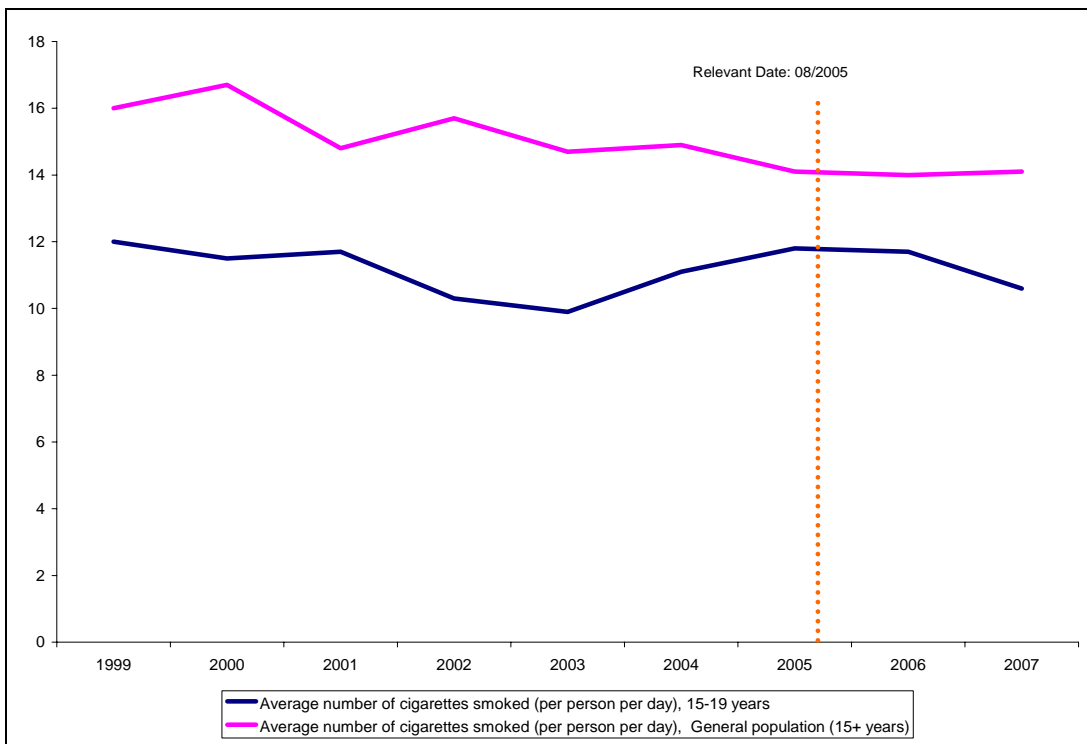
6.7 Figure 6.3 and Figure 6.4 illustrate cigarette smoking prevalence and average number of cigarettes smoked (per person per day) in Manitoba.

**Figure 6.3: Cigarette Smoking Prevalence in Manitoba**



Source: Canadian Tobacco Use Monitoring Surveys, 1999-2007

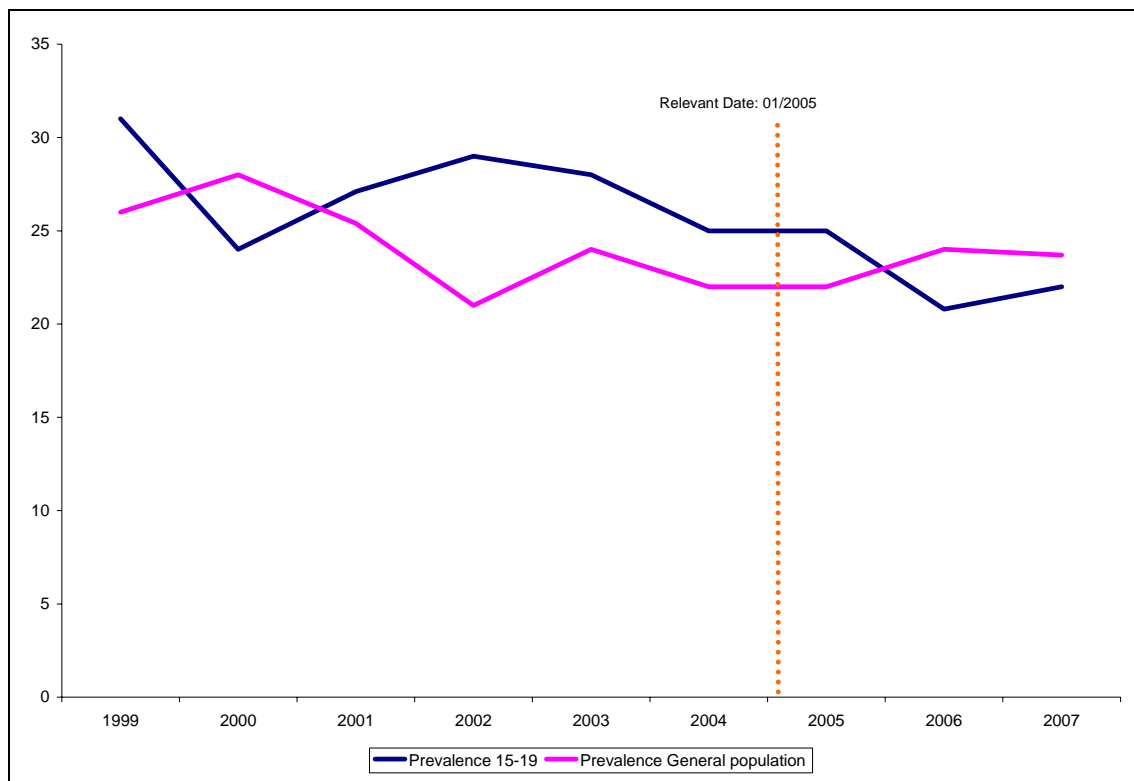
**Figure 6.4: Average number of cigarettes smoked (per person per day) in Manitoba**



Source: Canadian Tobacco Use Monitoring Surveys, 1999-2007

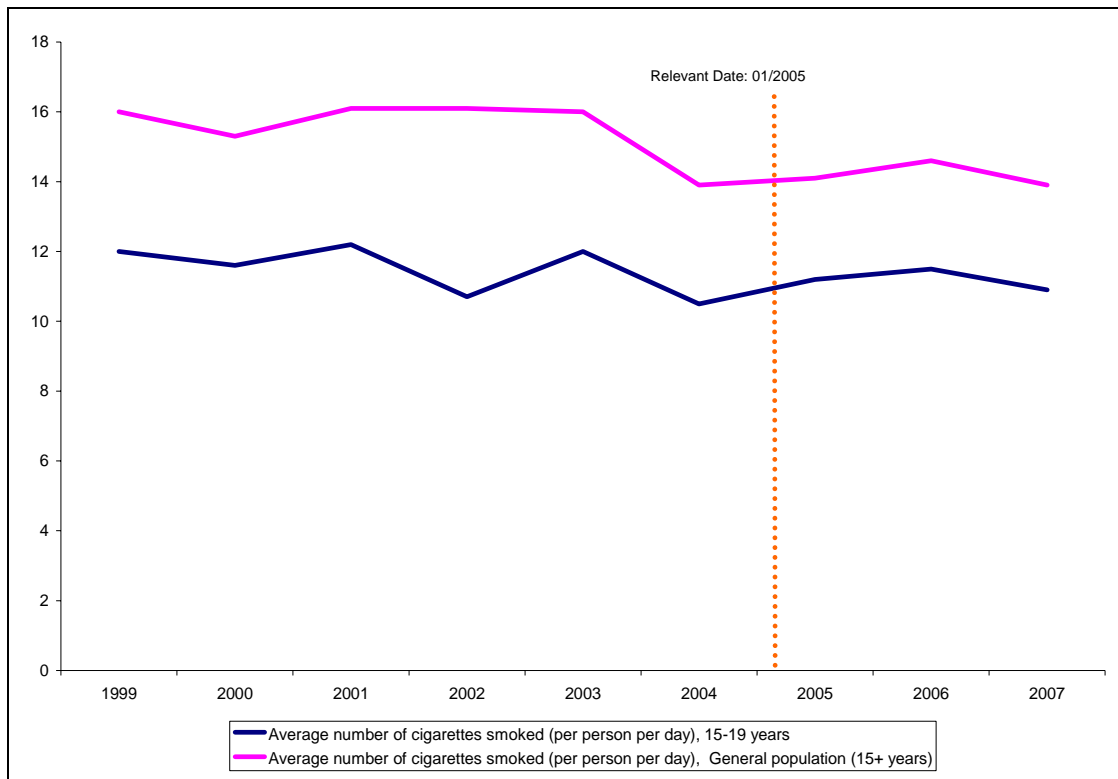
- 6.8 The prevalence trend for the general population and for 15-19 year olds in Manitoba in Figure 6.3 seems to be falling.
- 6.9 The number of cigarettes smoked (per person per day) for 15-19 year olds in Manitoba in Figure 6.4 seems as trend-less as the prevalence series for this age group. Therefore, while we acknowledge that the number of data points after the Relevant Date of the policy is limited, it seems difficult to conclude that the display ban has done anything to change smoking behaviour amongst the young in Manitoba, which seems relatively fixed and constant over time. There may be more of a suggestion of a downward trend in the series for the general population on cigarettes smoked (per person per day) but again it does not seem to be a strong one.
- 6.10 Figure 6.5 and Figure 6.6 illustrate cigarette smoking prevalence and average number of cigarettes smoked (per person per day) in Saskatchewan.

**Figure 6.5: Cigarette Smoking Prevalence in Saskatchewan**



Source: Canadian Tobacco Use Monitoring Surveys, 1999-2007

**Figure 6.6: Average number of cigarettes smoked (per person per day) in Saskatchewan**



Source: Canadian Tobacco Use Monitoring Surveys, 1999-2007

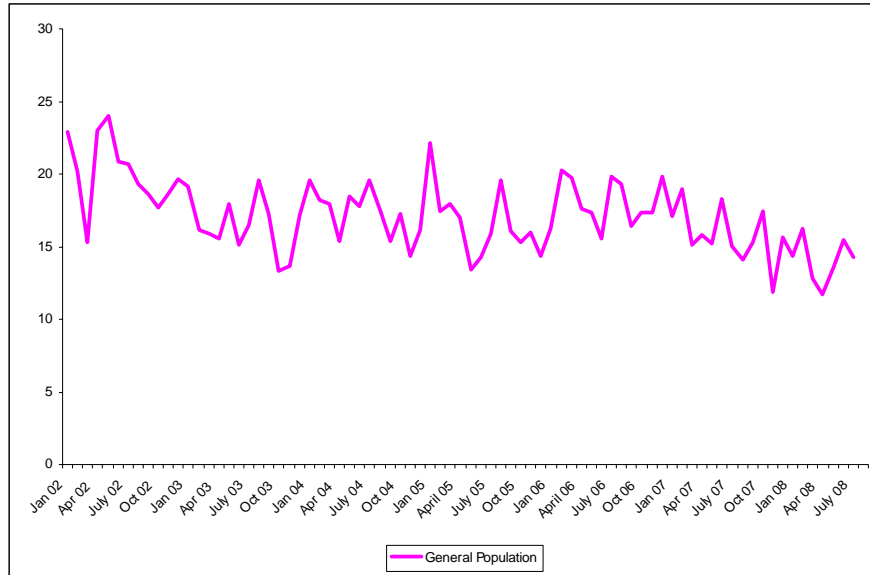
6.11 Upon visual inspection there appears to be a general downward trend in the prevalence series, for Saskatchewan.

*Monthly data*

6.12 Monthly data on the percentages smoking daily in British Columbia, Manitoba and Saskatchewan are exhibited in Figure 6.7, Figure 6.8, and Figure 6.9.

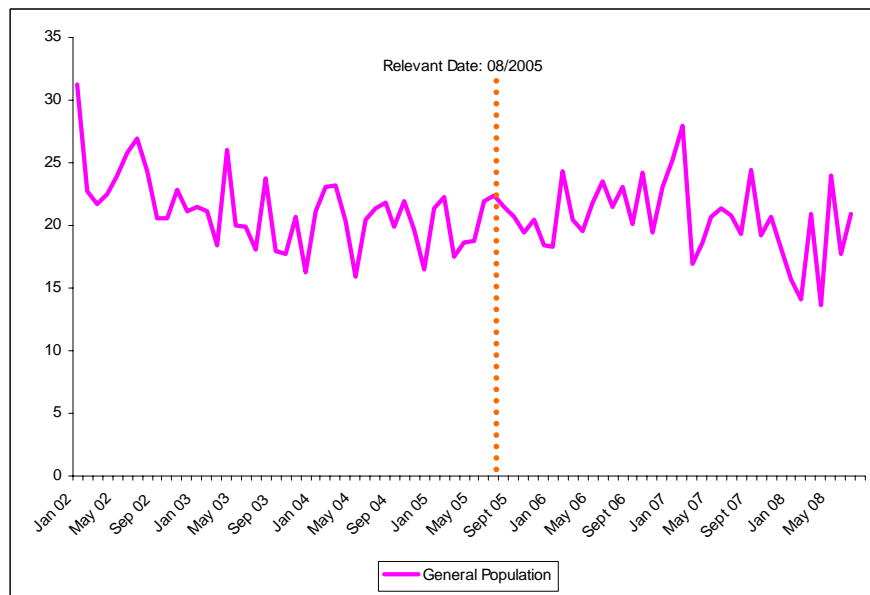


**Figure 6.7: Percentage of people that are daily smokers in British Columbia (sample weighted according to the actual population distribution)**



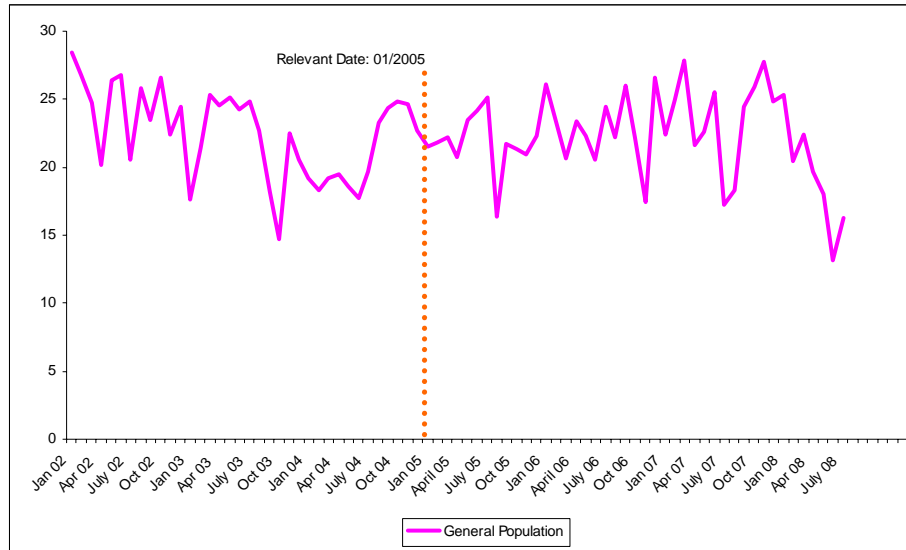
Source: Data for the period of January 2002 to February 2007 were collected through an Omnibus Tracking Study conducted by Maritz Research Company. The data from February 20, 2007 onwards were collected through a tracking study performed by Research Strategy Group.

**Figure 6.8: Percentage of people that are daily smokers in Manitoba (sample weighted according to the actual population distribution)**



Source: Data for the period of January 2002 to February 2007 were collected through an Omnibus Tracking Study conducted by Maritz Research Company. The data from February 20, 2007 onwards were collected through a tracking study performed by Research Strategy Group.

**Figure 6.9: Percentage of people that are daily smokers in Saskatchewan (sample weighted according to the actual population distribution)**



Source: Data for the period of January 2002 to February 2007 were collected through an Omnibus Tracking Study conducted by Maritz Research Company. The data from February 20, 2007 onwards and on were collected through a tracking study performed by Research Strategy Group.

- 6.13 The statistical advantage which this monthly data has over annual data is that they have sufficient data points after the display bans to perform Chow tests. We have performed such tests and present our results in the Appendix.
- 6.14 These Chow tests provide a statistically robust basis to reject any claim of a structural break in the series after the display bans — that is to say, smoking prevalence is statistically unaffected, so far, by these bans. Display bans have not yet affected the percentage daily smokers in Manitoba and Saskatchewan. Of course, the time period is clearly still relatively short, and it remains possible in principle that an effect might be visible over a longer timescale.

**The FTC Document References to Canada**

- 6.15 The FTC Document states (paragraph 3.45):

Although the evidence about the public health benefits of prohibiting the display of tobacco products in retail environments is strong, it is not conclusive. A doubt about the direct causal link between banning display and reduction in tobacco consumption was included in Health Canada’s 2006 consultation on the issue. Referring to the recent fall in tobacco consumption in Canada, the consultation document observed that ‘it is possible

that restrictions on tobacco displays at retail will have an impact on this trend, but this remains **very speculative** at this time'. (Emphasis added.)

6.16 This picture of uncertainty is repeated in the Impact Assessment (paragraph 33):

Evidence on teenage smoking in Canada is largely inconclusive, with increases in youth (and overall) smoking rates in some areas, and decreases in others. It is difficult to draw any conclusions from the data; it only covers a small number of time periods, (crucially) does not control for other factors affecting smoking prevalence, and the surveys may not have the statistical power to detect smaller changes in prevalence.

6.17 The analysis above suggests that the claim that the display bans have impacted upon tobacco consumption in Canada remains "very speculative" as of 2008. We cannot yet conclude from these data alone that the regulatory restrictions in these Canadian provinces have resulted in reduced prevalence or consumption.

### **General Conclusions**

6.18 With some possible exceptions, such as youth prevalence in Saskatchewan, smoking prevalence appears to be generally declining in all these jurisdictions. Based on the limited data here, this seems to be a long-term, general trend rather than a consequence of display bans.

6.19 The FTC Document states (paragraph 3.44):

While it is recognised that the introduction of restrictions on tobacco display in retail environments is unlikely to bring an immediate benefit to health or smoking prevalence, evidence suggests that we could expect to see fewer young people starting to use tobacco, and that smoking prevalence among young people could decline at a faster rate than we are currently experiencing.

6.20 The evidence we have analysed is that display bans have indeed not yet had any impact upon established trends in prevalence and consumption. More specifically, this is true:

(a) for any age group and, more importantly, also for the young, who are an important consideration for policy-makers.

(b) for all countries and jurisdictions considered.

Whether they might eventually have an impact can only be speculated.

6.21 FTC paragraph 3.44 continues:

As with all measures in tobacco control, it is difficult to disaggregate the precise benefits of specific changes. A display ban would be one element within the Government's comprehensive and multi-faceted tobacco control programme. In the long run, based on the Department of Health's analysis within the attached consultation-stage impact assessment (see Annex 3), any losses incurred by retailers or the tobacco industry would be more than offset by the benefits accruing from the number of lives saved, reduced

levels of smoking related disease and the wider 'denormalisation' of tobacco use in our communities.

- 6.22 We note that, with sufficiently rich data and available analytical technique, across a wide spectrum of policy areas, it is generally accepted that it *is* necessary for a policymaker, before introducing a regulation, to at least attempt to "disaggregate the precise benefits of specific changes" in order to justify policy action, rather than relying on a vague assertion that the policy is bound to be a good idea because it is related to other policies in the same area. That is, after all, why, it is considered necessary to carry out impact assessments.

### **Price effects**

- 6.23 In previous sections we have discussed the possible price paths for cigarettes following a display ban and/or plain packs requirement. We have argued that the price path is not completely clear, but that price falls in at least the short term are plausible under some scenarios for a plain packs requirement. Were prices indeed to fall, this might perhaps, at least in principle, have an impact upon smoking prevalence. Studies differ on precisely how responsive smoking is to price. Moreover, it is sometimes argued that responsiveness is likely to be greater in respect of price falls than of price rises. Furthermore, these effects are unlikely to fall uniformly across the population — the FTC Document suggests that price responsiveness varies with respect to age and income. Thus, if policy makers see a display ban and/or plain packs as a means of reducing smoking amongst the young and lower income groups then they should take account, in their policy judgement, of the possibility that the policy has what they would presumably regard as perverse effects through inducing a change in the dimensions of competition such that prices fall.

## 7 OTHER EFFECTS

7.1 In addition to the possible or intended effects of a display ban and/or a plain packs requirement upon consumer choice, innovation, competition and prevalence discussed in previous sections, there would also be broader impacts upon employment and tax implications, which we now discuss.

### Tax Revenue Loss

7.2 If counterfeiting and contraband were indeed to increase, that would reduce output by, and sales from, legitimate manufacturers and thereby reduce the tax take.

7.3 Tax and duty revenues from the sales of cigarettes in the UK amounted to £9.2bn in 2007.<sup>28</sup> Given the high taxes imposed on cigarettes the UK also experiences a high level of smuggling and cross-border shopping. Definite and official numbers on the volume of cigarettes that are either smuggled into the UK, produced as counterfeits within the UK, or legally purchased outside the UK are, by definition of the activities, not available. Instead, one must rely upon estimates.

7.4 Estimates suggest that some 8 per cent<sup>29</sup> to 27 per cent<sup>30</sup> of cigarettes reaching the UK market are *non-UK duty paid* (NUKDP). HM Revenue and Customs believe that that consumption of NUKDP within the period 2005-2006 may have led to revenue losses to the UK Exchequer of between £3.8bn and £4.3bn.<sup>31</sup> These are clearly significant sums. A loss of tax revenues on this scale constitutes a considerable restriction on the exchequer's scope for action.

7.5 It is plausible that, if a display ban or plain packs requirement were to be introduced, the revenues losses could be even larger. In case of a display ban we would expect counterfeiting to increase because at present presumably even quite minor visual flaws in a counterfeit product become obvious if it sits visibly amidst genuine product. But if visibility were reduced, counterfeiting standards would not need to be so high to go unnoticed. So a display ban can be expected to lead to a material increase in counterfeiting, reducing tax revenues from tobacco accordingly.

7.6 The impact of plain packs in this respect is likely to be even greater. A plain packs measure would be expected to increase the incidence of counterfeit cigarettes, because it would become much less expensive to duplicate cigarette packs. In addition, there might be a niche market for product that had the outward appearance of the pre-plain-packs-requirement product, and in the absence of genuine product for comparison, it might be difficult for consumers to distinguish counterfeits from genuine product contraband.

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<sup>28</sup> Source: *UK Tobacco Facts — April 2008*, Tobacco Manufacturers' Association

<sup>29</sup> Source: FTC Document paragraph 2:29.

<sup>30</sup> Source: *UK Tobacco Facts — April 2008*, Tobacco Manufacturers' Association

<sup>31</sup> Source: *UK Tobacco Facts — April 2008*, Tobacco Manufacturers' Association

Consequently, tax revenues from tobacco can be expected to decrease under a plain packs measure due to increased counterfeiting.

- 7.7 Contraband might also increase with a plain packs requirement, with illegal imports from jurisdictions that did not have plain packs. This might be more attractive than today, because such imports could be sold at a premium price because of their branding. Therefore, tax revenues from tobacco may also be impacted by an increase in contraband under the plain packs measure.
- 7.8 The losses to tax revenue via counterfeit and contraband cigarettes are already significant and can be expected to increase under a display ban and even more so under a plain packs measure. This consideration should not be disregarded, particularly in the context of tightening public finances.

### **Direct Employment Effect of Proposals**

- 7.9 The impact of tobacco manufacturing on UK employment was estimated as at 2002 as follows:<sup>32</sup>
- A total of 6,845 workers (all full-time) were employed directly in tobacco manufacturing;
  - Tobacco manufacturing was estimated to support 23,311 jobs (20,232 Full Time Equivalent jobs) across the economy through the supply chain (backward linkages);
  - Employment related to the distribution of tobacco products (forward linkages) was estimated at 57,826 jobs (40,979 Full Time Equivalent jobs); and
  - Thus, total tobacco related employment was 87,982 (68,056 Full Time Equivalent jobs).
- 7.10 Our analysis of prevalence trends in jurisdictions where similar policies to those considered in the FTC Document have previously been introduced suggested that, while prevalence is in long-term decline across the developed world irrespective of variations in regulatory environment between jurisdictions, there was not yet evidence that these policies had altered these long-term trends. As prevalence continues to decline in the UK, we can expect the employment impact of tobacco manufacturing upon the UK to also naturally decline. To the extent that a display ban increases counterfeit/contraband we would expect this decline in employment by legitimate manufacturers to be accelerated by a display ban.
- 7.11 In the case of a plain packs requirement, there are various reasons to suppose a negative employment impact. First, if plain packs are seen as enabling additional economies of scale in tobacco manufacturing, this would mean that fewer labour resources are required

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<sup>32</sup> DTZ Pidea Consulting, *The Impact of the Tobacco Industry on Employment in the UK*, April 2004

to produce an equal number of plain packs as non-plain packs. Second, for the reasons stated, the plain packs measure can be expected to increase the incidence of both counterfeit and contraband, leading to a commensurate decrease in legitimate industry employment directly created by the tobacco industry.

## Indirect Employment Effect of Proposals

- 7.12 We have explained our basis for believing that, for various reasons, a direct employment impact on the tobacco industry can be anticipated as following from both a display ban and a plain packs measure. In economic theory it is generally thought that direct employment impacts do not occur in isolation from other sorts of employment impacts. There are, in the jargon of economics, direct effects, indirect effects, and induced effects.
- Direct effects are accounted for by employees that the tobacco industry itself would retain or take on.
  - Indirect effects are accounted for by employees that supply companies would retain or take on. Effects among suppliers directly related to the client company are also known in economics terms as “linkage effects”.
  - Induced employment arises from the increase in income and expenditure that in turn arises from the total of direct and indirect job gains described above. Income and expenditure lead to increased demand for goods and services, and thereby to a further increase in jobs, in the wider economy. These induced effects are sometimes also referred to as “multiplier effects”.
- 7.13 Multiplier effects may be thought of as the ripples in a pool when a stone is thrown in. The ripples closest to the stone are the strongest, but they operate only over a small area. Ripples at the outer edge of the pool are much larger in diameter but much weaker.
- 7.14 Given that these impacts follow from the incidence of counterfeits and contraband, it is difficult ex-ante to quantify how large they are likely to be. However, consideration of the economic linkages associated with the tobacco industry suggest that they are likely to be at least non-trivial.
- 7.15 First, tobacco manufacturers can be expected to reduce their demand for printing and related services. Total expenditure by UK tobacco manufacturers upon “paper, packaging, etc” was £197.2m in 2003.<sup>33</sup> We presume that printing services are contained within this figure and any reduced spending upon such services can be expected to have a knock-on, negative employment impact. Second, spending by tobacco manufacturers on branding consultants and similar can be expected to fall considerably, also generating a knock-on, negative employment impact.<sup>34</sup> This effect may be non-trivial. Moreover, it

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<sup>33</sup> Tobacco Manufacturers Association, January 2004

<sup>34</sup> Tobacco Manufacturers Association, January 2004

may be associated with more intangible, negative impacts upon industries of increasing policy and business concern: the creative industries.

## **The UK Tobacco Market and the UK Creative Industries**

### *The Creative Industries in the UK*

- 7.16 The UK government has placed increasing importance upon the creative industries. For example, as part of the Creative Economy Programme the Department for Culture Media and Sport commissioned Will Hutton and the Work Foundation to produce an economic analysis of the Creative Economy in the UK. In the foreword to the resulting paper, "Staying ahead: the economic performance of the UK's creative industries", the then Secretary of State for Culture, Media and Sport, Rt. Hon. Tessa Jowell MP said:

The Creative Economy Programme, which we began in November 2005, is one of the most important pieces of work undertaken by the DCMS. The size of the creative industries is comparable to the financial services sector. They now make up 7.3 per cent of the economy, and are growing at 5 per cent per year (almost twice the rate of the rest of the economy). Including those working in related creative occupations, the creative economy employs 1.8 million people.

The UK creative industries outperform every other European state and in the 21st century they have moved to centre stage of the UK economy. It is vital to the whole economy that Government works with industry to create a framework in which these sectors can flourish.

- 7.17 The tobacco industry has long contributed towards the expansion of the UK creative industries. Today pack design constitutes the main interface between the tobacco and creative industries. The innovative pack designs which those specialising in such work provide to the tobacco industry create synergies for the provision of similar services in other sectors. Thus, the plain packs policy would negatively impinge upon the ability of such firms to maximise their contribution to the UK's creative industries.



## 8 THE FTC IMPACT ASSESSMENT

### Impact upon Competition

8.1 In Annex 3 of the FTC Document, the consultation-stage impact assessment, at the Appendix on p80 it is stated:

#### Competition assessment

1. Option 2<sup>35</sup> would not directly limit the number or range of suppliers.
2. Option 2 is unlikely to indirectly limit the number or range of suppliers. Because the regulations would apply to all tobacco retailers (specialist tobacconists excepted), the proposal does not significantly raise the costs for some existing suppliers relative to others. The proposal may slightly increase the cost of entering an affected market, but any regulation would be sufficiently flexible to enable compliance with the policy at a low cost (e.g. through the use of a screen or curtain).
3. Option 2 reduces the ability of suppliers to advertise their products, and as such may have a marginal effect on competition. Because a plain price list will be permitted in all cases, the provision of price information to consumers will not be distorted.
4. Option 2 is not likely to reduce the incentive to compete vigorously.

8.2 Taking these points in turn:

- We agree that the measure would not *directly* limit the number or range of suppliers.
- We disagree that the measure is “unlikely to indirectly limit the number or range of suppliers”. As discussed in previous sections, evidence from other jurisdictions (which we note were considered relevant for the purposes of the impact assessment — e.g. see paragraph 33, p76 of the FTC Document) suggests that concentration would tend to be increased (relative to its expected evolution) and innovation reduced by a display ban. Each of these would be likely, over time, to indirectly limit the number and range of suppliers.
- We disagree that “the proposal does not significantly raise the costs for some existing suppliers relative to others”. On the contrary, competition in the tobacco market appears to involve a combination of some players that rely on a few very strong brands and others employing more brand variety so as to seek out new and existing market niches. Firms in the latter category would, without display, find it more difficult to achieve market entry for new product, and would therefore be forced into

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<sup>35</sup> i.e. “Introduce a complete prohibition on the display of tobacco products, with no other advertising. A plain price list would be permitted.” See FTC Document p71.

alternative strategies (such as heavy discounting at market entry) that imposed upon them greater costs than their rivals with fewer more mainstream products.

- We agree that the proposal would “increase the cost of entering an affected market”. We are unsure by what scale “slightly” is to be measured in point 2.
- We agree that consumers will still be able to observe prices.
- Our discussion of the senses in which a display ban would and would not be merely an advertising ban and those in which it would be something additional to an advertising ban appear in Section 3 above.
- We are unsure whether “Option 2 is not likely to reduce the incentive to compete vigorously.” Theory may suggest that the effects on this would be relatively more limited than those on innovation, as discussed in Sections 4 and 5 above, but in practice the evidence from other jurisdictions appears to imply that market dynamism is more affected than might be expected. We have speculated above that this may be because a display ban brings to actualisation a number of negative competition effects driven by other tobacco control measures.

8.3 Overall our view is that the data suggests that a display ban would, in practice, have more impact upon competition than theory alone might suggest, and we would recommend the regulatory authorities to include an assessment of these data before coming to any final decision on this measure.

## 9 APPENDIX I: QUANTITATIVE ANALYSIS

9.1 This section provides further details of the statistical tests we have applied. We have adopted the following notation:

*HHI\_Producers* is the concentration index of cigarette manufacturers

*HHI\_Brands* is the concentration index of cigarette brands

*U* are the residuals of the models estimated

*C* is the intercept of the OLS (Ordinary Least Squares) model

*T* is the time variable

*Prev\_Man* is the smoking prevalence among young people in Manitoba

*Prev\_Sas* is the smoking prevalence among young people in Saskatchewan

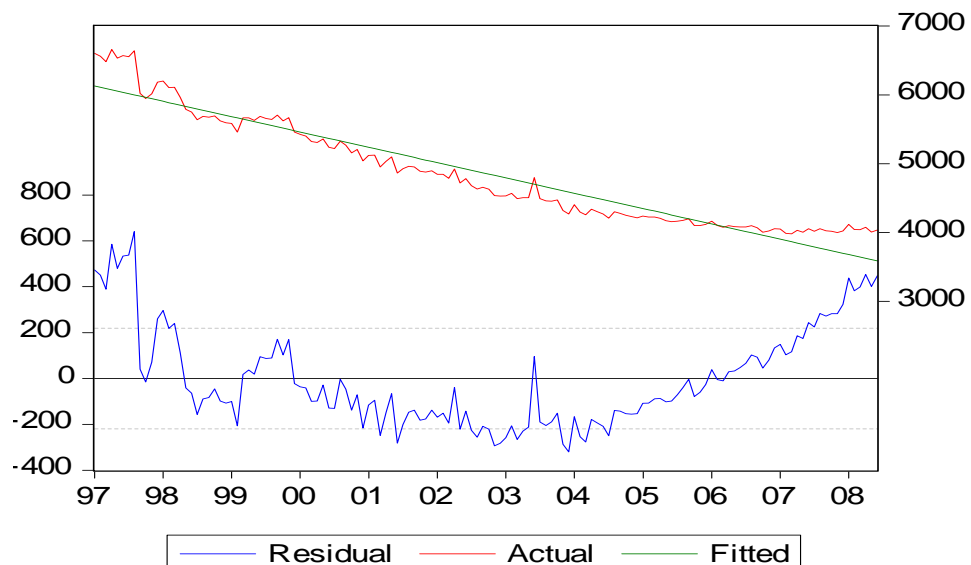
*Gen\_Prev\_Man* is the smoking prevalence among the general population in Manitoba

*Gen\_Prev\_Sas* is the smoking prevalence among the general population in Saskatchewan

### Analysis of Competition for Iceland

9.2 The time series *HHI\_P* is clearly not stationary as it displays a trend. In order to smooth the series we detrended it as exhibited in the figure below.

Figure 9.1: Detrending of *HHI\_Producers*



9.3 We have then performed an Augmented Dickey-Fuller test in order to check that the residuals are stationary. The output of the test is displayed below and allows rejecting the null hypothesis of a unit root (i.e., non-stationary) at the 95 percent confidence interval.

**Table 9.1: Stationary test for residuals**

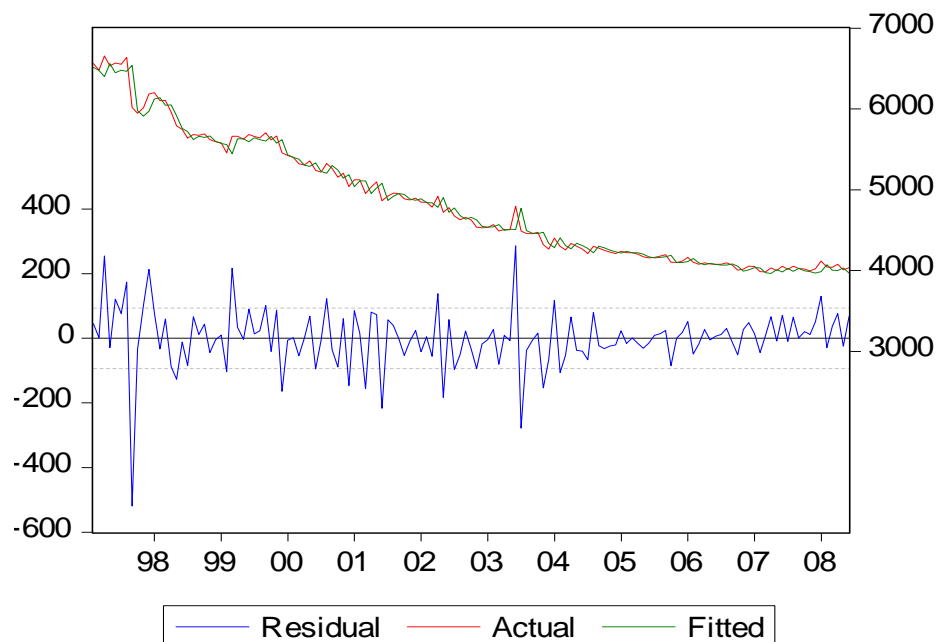
ADF Test Statistic	-2.128044	1% Critical Value*	-2.5808	
		5% Critical Value	-1.9422	
		10% Critical Value	-1.6169	
*MacKinnon critical values for rejection of hypothesis of a unit root.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(U)				
Method: Least Squares				
Sample(adjusted): 1997:03 2008:06				
Included observations: 136 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
U(-1)	-0.080908	0.038020	-2.128044	0.0352
D(U(-1))	-0.225139	0.083986	-2.680690	0.0083
R-squared	0.099809	Mean dependent var		-0.023101
Adjusted R-squared	0.093091	S.D. dependent var		96.46207
S.E. of regression	91.86253	Akaike info criterion		11.89306
Sum squared resid	1130789.	Schwarz criterion		11.93589
Log likelihood	-806.7281	Durbin-Watson stat		2.058798

9.4 We have then studied the series and concluded that the model that best describes it is an AR(1) model with trend and intercept. The estimation outputs of the model and the graph showing the fit of the model are reported below.

**Table 9.2: Estimation output for HHI\_Producers**

Dependent Variable: HHI_PRODUCERS				
Method: Least Squares				
Sample(adjusted): 1997:02 2008:06				
Included observations: 137 after adjusting endpoints				
Convergence achieved after 4 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5900.888	203.3583	29.01719	0.0000
T	-15.70651	2.319628	-6.771132	0.0000
AR(1)	0.900543	0.037195	24.21171	0.0000
R-squared	0.985086	Mean dependent var	4844.437	
Adjusted R-squared	0.984864	S.D. dependent var	761.1455	
S.E. of regression	93.64394	Akaike info criterion	11.93853	
Sum squared resid	1175071.	Schwarz criterion	12.00247	
Log likelihood	-814.7894	F-statistic	4425.467	
Durbin-Watson stat	2.441579	Prob(F-statistic)	0.000000	
Inverted AR Roots	.90			

**Figure 9.2: Fit of the AR(1) model for HHI\_Producers**



9.5 Although in this model all coefficients are highly significant (at the 95 percent confidence level), we wish to test for the existence of a structural break in the series as the declining

trend is more marked in the period that precedes the Relevant Date. We chose August 2002 (i.e. one year after the regulation was introduced) as a candidate date for the break. Despite being arbitrary, this choice is justified by the idea that the market mechanisms need some time to adjust to the Relevant Date the regulation. The presence or otherwise of a structural break was formally investigated with a Chow test. The results (reported below) reject the hypothesis of a lack of break at the 95 percent confidence level. In a Chow test, rejection of the null hypothesis implies the existence of a break in the series and, thus, the need to estimate two separate regressions.

**Table 9.3: Chow test for HHI\_Producers**

Chow Breakpoint Test: 2002:08			
F-statistic	6.636415	Probability	0.000330
Log likelihood ratio	19.38295	Probability	0.000228

- 9.6 We have therefore re-estimated the series separately for the two samples. The estimation output for the pre-regulation sample and for the post-regulation samples are, respectively:

**Table 9.4: Estimation output for HHI\_Producers prior to regulation**

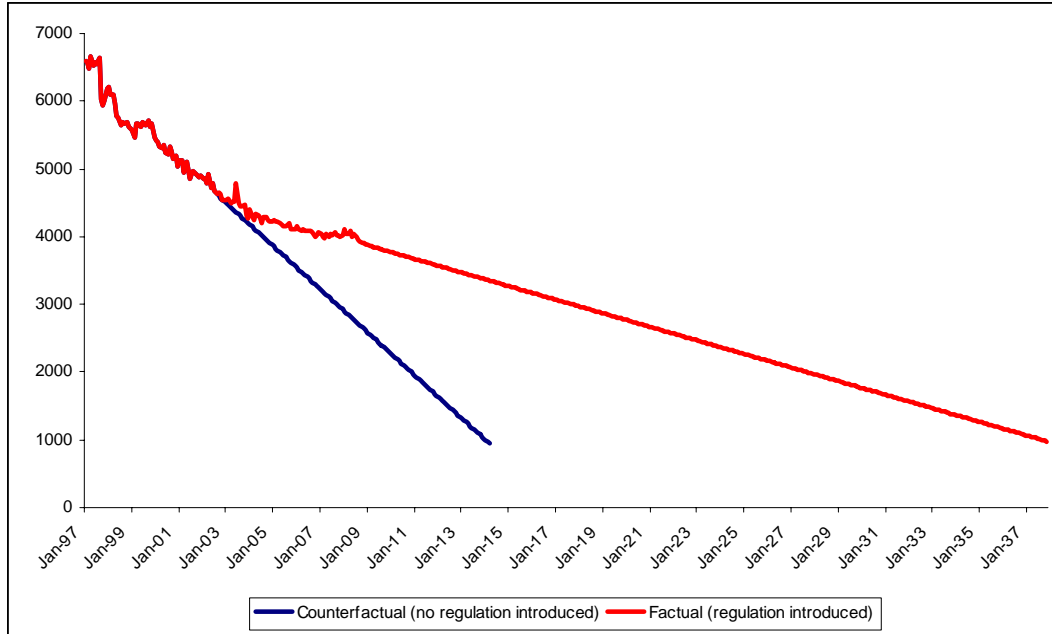
Dependent Variable: HHI_PRODUCERS				
Method: Least Squares				
Sample(adjusted): 1997:02 2002:08				
Included observations: 67 after adjusting endpoints				
Convergence achieved after 3 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6395.293	84.26540	75.89465	0.0000
T	-26.48074	2.058606	-12.86343	0.0000
AR(1)	0.665875	0.091439	7.282201	0.0000
R-squared	0.961823	Mean dependent var		5500.783
Adjusted R-squared	0.960630	S.D. dependent var		545.6793
S.E. of regression	108.2727	Akaike info criterion		12.25093
Sum squared resid	750271.0	Schwarz criterion		12.34964
Log likelihood	-407.4060	F-statistic		806.2058
Durbin-Watson stat	2.136729	Prob(F-statistic)		0.000000
Inverted AR Roots	.67			

**Table 9.5: Estimation output for HHI\_Producers after regulation**

Dependent Variable: HHI_PRODUCERS				
Method: Least Squares				
Date: 08/22/08 Time: 09:50				
Sample: 2002:09 2008:06				
Included observations: 70				
Convergence achieved after 3 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5072.306	106.8169	47.48598	0.0000
T	-8.354247	1.007395	-8.292919	0.0000
AR(1)	0.621085	0.097023	6.401455	0.0000
R-squared	0.898252	Mean dependent var		4216.221
Adjusted R-squared	0.895215	S.D. dependent var		195.9460
S.E. of regression	63.42888	Akaike info criterion		11.17963
Sum squared resid	269555.9	Schwarz criterion		11.27599
Log likelihood	-388.2870	F-statistic		295.7441
Durbin-Watson stat	2.275931	Prob(F-statistic)		0.000000
Inverted AR Roots	.62			

- 9.7 An important aspect to note is that the trend coefficient in the pre-regulation series is significantly larger (in absolute value) than that in the post-regulation series. In contrast, the autoregressive coefficients of the two regressions are very similar. This confirms the idea that the structural break is mainly due to a change in the rate at which concentration falls over time.
- 9.8 We can interpret our results in intuitive economic terms by carrying out a simulation exercise. We have used the autoregressive models of Table 9.4 and Table 9.5 to forecast the decrease in concentration index under two different scenarios.
- 9.9 First we have simulated the future decrease in the concentration after the regulation has been introduced (the “factual scenario”). This appears in red. Next we simulated how the concentration index would have decreased had the regulation not been introduced (the “counterfactual scenario”). As the figure below shows, under the factual scenario the market is projected to become highly competitive (HHI\_Producer index below 1000) in the year 2037. However, had the regulation not been introduced in 2001, the market would have become highly competitive by 2014. Thus the impact of the regulation has been to delay the arrival of a competitive market by 23 years.

**Figure 9.3: Simulation of the increase in competition in the absence of regulation**



9.10 It is important to stress that the results of the simulations are only indicative as they abstract from all other possible factors (e.g. market entry/exit, mergers etc.) that could influence the market structure.

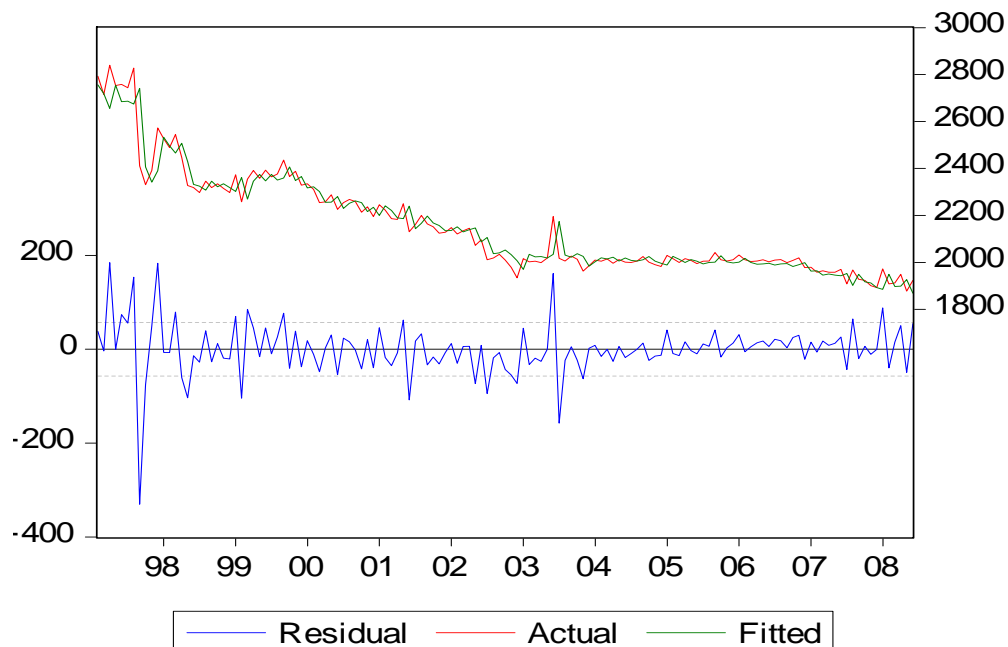
9.11 We have replicated the same approach to study the series HHI\_Brands. We concluded that the best fitting model for the series is again an AR(1) model with trend and intercept. The estimation output and the model fit are depicted below.



**Table 9.6: Estimation output for HHI\_Brands**

Dependent Variable: HHI_BRANDS				
Method: Least Squares				
Sample(adjusted): 1997:02 2008:06				
Included observations: 137 after adjusting endpoints				
Convergence achieved after 3 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2446.377	53.43782	45.77988	0.0000
T	-4.336248	0.640157	-6.773725	0.0000
AR(1)	0.800125	0.046630	17.15895	0.0000
R-squared	0.933009	Mean dependent var		2156.539
Adjusted R-squared	0.932010	S.D. dependent var		219.4812
S.E. of regression	57.22967	Akaike info criterion		10.95368
Sum squared resid	438881.5	Schwarz criterion		11.01762
Log likelihood	-747.3268	F-statistic		933.1404
Durbin-Watson stat	2.336273	Prob(F-statistic)		0.000000
Inverted AR Roots	.80			

**Figure 9.4: Fit of the AR(1) model for HHI\_Brands**



9.12 We have also performed the Chow structural break test at the same date (August 2002) and we have failed to reject the hypothesis that there is no break in the series.

**Table 9.7: Chow test for HHI\_Brands**

Chow Breakpoint Test: 2002:08			
F-statistic	5.750740	Probability	0.000999
Log likelihood ratio	16.94933	Probability	0.000724

9.13 The estimation output of the two separate regressions are included in the tables below and also show that brand concentration decreases at a much slower pace after the Relevant Date.

**Table 9.8: Estimation output for HHI\_Brands prior to regulation**

Dependent Variable: HHI_BRANDS				
Method: Least Squares				
Sample(adjusted): 1997:02 2002:02				
Included observations: 61 after adjusting endpoints				
Convergence achieved after 3 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2598.000	59.77021	43.46646	0.0000
T	-8.094704	1.589494	-5.092631	0.0000
AR(1)	0.664932	0.092198	7.211971	0.0000
R-squared	0.854371	Mean dependent var	2354.307	
Adjusted R-squared	0.849350	S.D. dependent var	184.9011	
S.E. of regression	71.76692	Akaike info criterion	11.43265	
Sum squared resid	298728.4	Schwarz criterion	11.53647	
Log likelihood	-345.6959	F-statistic	170.1368	
Durbin-Watson stat	2.100738	Prob(F-statistic)	0.000000	
Inverted AR Roots	.66			

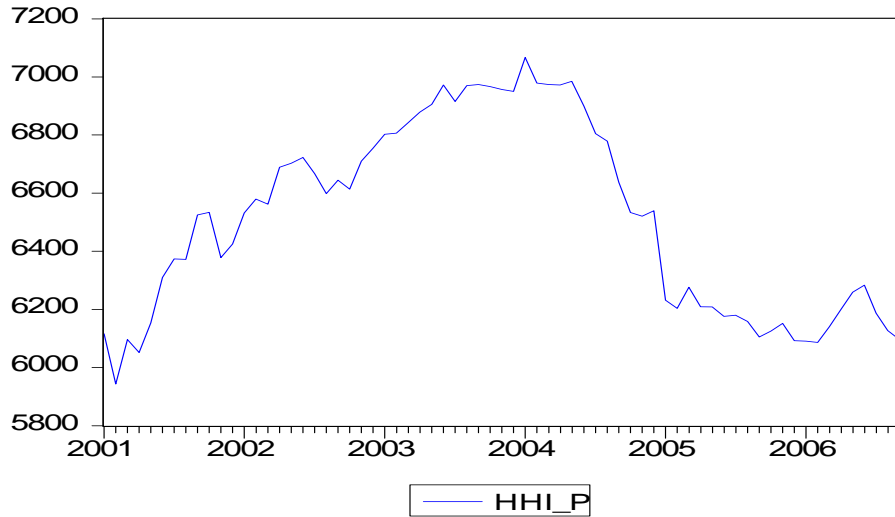
**Table 9.9: Estimation output for HHI\_Brands after regulation**

Dependent Variable: HHI_BRANDS				
Method: Least Squares				
Date: 08/21/08 Time: 12:35				
Sample: 2002:03 2008:06				
Included observations: 76				
Convergence achieved after 3 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2146.773	32.92206	65.20774	0.0000
T	-1.505221	0.320724	-4.693194	0.0000
AR(1)	0.420934	0.104082	4.044250	0.0001
R-squared	0.538938	Mean dependent var	1997.804	
Adjusted R-squared	0.526306	S.D. dependent var	51.54874	
S.E. of regression	35.47862	Akaike info criterion	10.01441	
Sum squared resid	91887.50	Schwarz criterion	10.10641	
Log likelihood	-377.5476	F-statistic	42.66510	
Durbin-Watson stat	2.190617	Prob(F-statistic)	0.000000	
Inverted AR Roots	.42			

## Analysis of Competition for Thailand

9.14 The analysis of the HHI\_P and HHI\_B series for Thailand has been limited because we could not reject the hypothesis that both series behave as random walks. When a series is a random walk the best forecast for its future value is the series' last value.

**Table 9.10: HHI\_Producers for Thailand**



9.15 The output of the Dickey-Fuller unit-root test for the HHI\_Producers series does not allow us rejecting the hypothesis of non-stationary (i.e. that the series is a random walk) at any of the standard confidence levels (Table 9.11). The first difference of the series is however stationary (Table 9.12).

**Table 9.11: Unit root test for HHI\_Producers and d(HH\_P)**

ADF Test Statistic	0.173515	1% Critical Value*	-2.5973
		5% Critical Value	-1.9452
		10% Critical Value	-1.6183
*MacKinnon critical values for rejection of hypothesis of a unit root.			

**Table 9.12: Unit root test for d(HHI\_P)**

ADF Test Statistic	-5.265231	1% Critical Value*	-2.5978
		5% Critical Value	-1.9453
		10% Critical Value	-1.6183
*MacKinnon critical values for rejection of hypothesis of a unit root.			

9.16 After inspection of the autocorrelation and partial autocorrelation function of the (first difference) integrated series we noted that it closely resembles a white noise process. We therefore concluded that the HHI\_P is best described by a random walk process.

## Chow Analysis of Smoking Prevalence for Canada

9.17 The series *Gen\_Prev\_BC*, *Gen\_Prev\_Man* and *Gen\_Prev\_Sask*, are all stationary as shown by the output of the unit-root test below

**Table 9.13: Stationary test for Gen\_Prev\_BC**

ADF Test Statistic	-4.581176	1% Critical Value*	-3.5164	
		5% Critical Value	-2.8991	
		10% Critical Value	-2.5865	
*MacKinnon critical values for rejection of hypothesis of a unit root.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(GEN_PREV_BC)				
Method: Least Squares				
Sample(adjusted): 2002:03 2008:07				
Included observations: 77 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEN_PREV_BC(-1)	-0.550786	0.120228	-4.581176	0.0000
D(GEN_PREV_BC(-1))	-0.022317	0.112987	-0.197523	0.8440
C	9.315496	2.071751	4.496436	0.0000
R-squared	0.283101	Mean dependent var	-0.077155	
Adjusted R-squared	0.263725	S.D. dependent var	2.589459	
S.E. of regression	2.221923	Akaike info criterion	4.472805	
Sum squared resid	365.3337	Schwarz criterion	4.564122	
Log likelihood	-169.2030	F-statistic	14.61115	
Durbin-Watson stat	1.958825	Prob(F-statistic)	0.000004	

**Table 9.14: Stationary test for Gen\_Prev\_Man**

ADF Test Statistic	-5.153198	1% Critical Value*	-3.5164	
		5% Critical Value	-2.8991	
		10% Critical Value	-2.5865	
*MacKinnon critical values for rejection of hypothesis of a unit root.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(GEN_PREV_MAN)				
Method: Least Squares				
Sample(adjusted): 2002:03 2008:07				
Included observations: 77 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEN_PREV_MAN(-1)	-0.735303	0.142689	-5.153198	0.0000
D(GEN_PREV_MAN(-1))	-0.144566	0.106286	-1.360164	0.1779
C	15.24619	2.996116	5.088652	0.0000
R-squared	0.442393	Mean dependent var	-0.024675	
Adjusted R-squared	0.427323	S.D. dependent var	3.634200	
S.E. of regression	2.750197	Akaike info criterion	4.899404	
Sum squared resid	559.7050	Schwarz criterion	4.990721	
Log likelihood	-185.6270	F-statistic	29.35502	
Durbin-Watson stat	2.005784	Prob(F-statistic)	0.000000	

**Table 9.15: Stationary test for Gen\_Prev\_Sask**

ADF Test Statistic	-4.373528	1% Critical Value*	-3.5164	
		5% Critical Value	-2.8991	
		10% Critical Value	-2.5865	
*MacKinnon critical values for rejection of hypothesis of a unit root.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(GEN_PREV_SASK)				
Method: Least Squares				
Sample(adjusted): 2002:03 2008:07				
Included observations: 77 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEN_PREV_SASK(-1)	-0.595180	0.136087	-4.373528	0.0000
D(GEN_PREV_SASK(-1))	-0.060694	0.120206	-0.504915	0.6151
C	13.15655	3.075372	4.278036	0.0001
R-squared	0.315304	Mean dependent var	-0.136364	
Adjusted R-squared	0.296798	S.D. dependent var	3.565917	
S.E. of regression	2.990276	Akaike info criterion	5.066790	
Sum squared resid	661.6894	Schwarz criterion	5.158107	
Log likelihood	-192.0714	F-statistic	17.03855	
Durbin-Watson stat	2.001847	Prob(F-statistic)	0.000001	

9.18 We have first tested for the existence of a trend by regressing the two series over the time variable T. The results are reported below.

**Table 9.16: Linear trend test for Gen\_Prev\_BC**

Dependent Variable: Gen_Prev_BC				
Method: Least Squares				
Sample: 2002:01 2008:07				
Included observations: 79				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.23026	0.491531	39.12317	0.0000
T	-0.054719	0.010880	-5.029343	0.0000
R-squared	0.247270	Mean dependent var		17.09621
Adjusted R-squared	0.237494	S.D. dependent var		2.525360
S.E. of regression	2.205184	Akaike info criterion		4.444489
Sum squared resid	374.4384	Schwarz criterion		4.504475
Log likelihood	-173.5573	F-statistic		25.29429
Durbin-Watson stat	1.380338	Prob(F-statistic)		0.000003

**Table 9.17: Linear trend test for Gen\_Prev\_Man**

Dependent Variable: Gen_Prev_Man				
Method: Least Squares				
Sample: 2002:01 2008:07				
Included observations: 79				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.41658	0.642632	34.88244	0.0000
T	-0.037945	0.014225	-2.667589	0.0093
R-squared	0.084598	Mean dependent var		20.93671
Adjusted R-squared	0.072709	S.D. dependent var		2.993976
S.E. of regression	2.883077	Akaike info criterion		4.980584
Sum squared resid	640.0341	Schwarz criterion		5.040570
Log likelihood	-194.7331	F-statistic		7.116033
Durbin-Watson stat	1.680196	Prob(F-statistic)		0.009310



**Table 9.18: Linear trend test for Gen\_Prev\_Sask**

Dependent Variable: Gen_Prev_Sask				
Method: Least Squares				
Sample: 2002:01 2008:07				
Included observations: 79				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	23.27915	0.717973	32.42344	0.0000
T	-0.023678	0.015892	-1.489917	0.1403
R-squared	0.028021	Mean dependent var		22.35570
Adjusted R-squared	0.015398	S.D. dependent var		3.246171
S.E. of regression	3.221081	Akaike info criterion		5.202302
Sum squared resid	798.9032	Schwarz criterion		5.262288
Log likelihood	-203.4909	F-statistic		2.219852
Durbin-Watson stat	1.214397	Prob(F-statistic)		0.140331

- 9.19 The trend coefficient of the series Gen\_Prev\_Sask is not significant at the 95 percent confidence interval and we can therefore say that smoking prevalence does not display a trend in Saskatchewan. For the series Gen\_Prev\_BC and Gen\_Prev\_Man, in contrast, the trend coefficients are significant. However, these simple linear models are likely to be mis-specified as they do not include autoregressive components that are potentially significant. As a result the significance of the trend coefficients may disappear when more adequate models are specified.
- 9.20 We have therefore studied the behaviour of the series as an ARMA process. Model selection exercises lead us to conclude that Gen\_Prev\_Man is best described by an AR(2) model with trend. The series Gen\_Prev\_Sask and Gen\_Prev\_Bc, in contrast, are best described by an AR(1) process, the estimation output of which are reported below.

**Table 9.19: Estimation output for Gen\_Prev\_BC**

Dependent Variable: Gen_Prev_BC				
Method: Least Squares				
Sample(adjusted): 2002:02 2008:07				
Included observations: 78 after adjusting endpoints				
Convergence achieved after 3 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	18.96219	0.681122	27.83962	0.0000
T	-0.049777	0.014854	-3.351110	0.0013
AR(1)	0.290994	0.108193	2.689578	0.0088
R-squared	0.290713	Mean dependent var		17.02126
Adjusted R-squared	0.271799	S.D. dependent var		2.451684
S.E. of regression	2.092137	Akaike info criterion		4.351951
Sum squared resid	328.2777	Schwarz criterion		4.442594
Log likelihood	-166.7261	F-statistic		15.37002
Durbin-Watson stat	1.941929	Prob(F-statistic)		0.000003
Inverted AR Roots	.29			

**Table 9.20: Estimation output for Gen\_Prev\_Sask**

Dependent Variable: Gen_Prev_Sask				
Method: Least Squares				
Sample(adjusted): 2002:02 2008:07				
Included observations: 78 after adjusting endpoints				
Convergence achieved after 3 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.18022	0.545429	40.66562	0.0000
AR(1)	0.382062	0.105919	3.607115	0.0006
R-squared	0.146176	Mean dependent var		22.27692
Adjusted R-squared	0.134941	S.D. dependent var		3.190282
S.E. of regression	2.967235	Akaike info criterion		5.038445
Sum squared resid	669.1409	Schwarz criterion		5.098873
Log likelihood	-194.4994	F-statistic		13.01128
Durbin-Watson stat	2.062324	Prob(F-statistic)		0.000552
Inverted AR Roots	.38			

**Table 9.21: Estimation output for Gen\_Prev\_Man**

Dependent Variable: Gen_Prev_Man				
Method: Least Squares				
Sample(adjusted): 2002:03 2008:07				
Included observations: 77 after adjusting endpoints				
Convergence achieved after 6 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
T	0.278084	0.107365	2.590089	0.0115
AR(1)	0.479915	0.100098	4.794431	0.0000
AR(2)	0.458026	0.096802	4.731559	0.0000
R-squared	-0.254447	Mean dependent var		20.77792
Adjusted R-squared	-0.288351	S.D. dependent var		2.777666
S.E. of regression	3.152805	Akaike info criterion		5.172644
Sum squared resid	735.5734	Schwarz criterion		5.263961
Log likelihood	-196.1468	Durbin-Watson stat		2.250659
Inverted AR Roots	.96	-.48		

9.21 In order to test for structural breaks in smoking prevalence, relative to the general trend in Canada reflected in our control (British Columbia), we have constructed two auxiliary series as follows:

Control\_Man which is constructed as (Gen\_prev\_Man) MINUS (Gen Prev\_BC)

Control\_Sask which is constructed as (Gen\_prev\_Sask) MINUS (Gen Prev\_BC)

9.22 These series allow us to test for a structural break in the data while using the province of British Columbia as a control variable.

9.23 The series for Saskatchewan relative to the control, Control\_Sask, is best described by an AR(1) process without trend (see output below)

**Table 9.22: Estimation of AR(1)**

Dependent Variable: CONTROL_SASK				
Method: Least Squares				
Sample(adjusted): 2002:02 2008:07				
Included observations: 78 after adjusting endpoints				
Convergence achieved after 3 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.238574	0.581904	9.002463	0.0000
AR(1)	0.274742	0.110842	2.478684	0.0154
R-squared	0.074794	Mean dependent var		5.255665
Adjusted R-squared	0.062620	S.D. dependent var		3.849247
S.E. of regression	3.726778	Akaike info criterion		5.494272
Sum squared resid	1055.554	Schwarz criterion		5.554700
Log likelihood	-212.2766	F-statistic		6.143874
Durbin-Watson stat	1.982726	Prob(F-statistic)		0.015404
Inverted AR Roots	.27			

9.24 We have conducted a series of Chow tests at several relevant dates (specifically, the date of enforcement of the display ban (January 2005 in Saskatchewan, one year later, and two years later)) and were unable to reject the hypothesis of a lack of structural break.

**Table 9.23: Structural break test at January 2005**

Chow Breakpoint Test: 2005:01			
F-statistic	0.682217	Probability	0.508645
Log likelihood ratio	1.425095	Probability	0.490393

**Table 9.24: Structural break test at January 2006**

Chow Breakpoint Test: 2006:01			
F-statistic	0.608499	Probability	0.546867
Log likelihood ratio	1.272352	Probability	0.529313

**Table 9.25: Structural break test at January 2007**

Chow Breakpoint Test: 2007:01			
F-statistic	1.334538	Probability	0.269541
Log likelihood ratio	2.763807	Probability	0.251100

9.25 We have repeated the analysis for Manitoba relative to the control, captured in the series Control\_Man. The best model to fit the series is an ARMA(1,1) model with intercept.

**Table 9.26: Estimation of ARMA(1,1)**

Dependent Variable: CONTROL_MAN				
Method: Least Squares				
Sample(adjusted): 2002:02 2008:07				
Included observations: 78 after adjusting endpoints				
Convergence achieved after 12 iterations				
Backcast: 2002:01				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.795635	0.290879	13.04886	0.0000
AR(1)	-0.870074	0.171419	-5.075708	0.0000
MA(1)	0.754156	0.205749	3.665415	0.0005
R-squared	0.048808	Mean dependent var		3.782588
Adjusted R-squared	0.023443	S.D. dependent var		2.773092
S.E. of regression	2.740394	Akaike info criterion		4.891783
Sum squared resid	563.2320	Schwarz criterion		4.982426
Log likelihood	-187.7795	F-statistic		1.924230
Durbin-Watson stat	1.922383	Prob(F-statistic)		0.153127
Inverted AR Roots	-.87			
Inverted MA Roots	-.75			

9.26 In this case, a break can be seen in August 2006.

**Table 9.27: Structural break test at August 2006**

Chow Breakpoint Test: 2006:08			
F-statistic	3.063500	Probability	0.033426
Log likelihood ratio	9.370311	Probability	0.024752

9.27 After estimating the models for the two separate samples, we can observe that the result is that, post-August 2006 (one year after the Relevant Date), there is an *increase* in smoking prevalence (denoted by the higher value of the intercept term). However, this result is not robust, as we shall now see.

**Table 9.28: Estimation of ARMA(1,1) pre-August 2006**

Dependent Variable: CONTROL_MAN				
Method: Least Squares				
Sample(adjusted): 2002:02 2006:08				
Included observations: 55 after adjusting endpoints				
Convergence achieved after 12 iterations				
Backcast: 2002:01				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.435836	0.338842	10.13995	0.0000
AR(1)	-0.561564	0.358937	-1.564522	0.1238
MA(1)	0.566875	0.375392	1.510086	0.1371
R-squared	0.018336	Mean dependent var		3.403012
Adjusted R-squared	-0.019420	S.D. dependent var		2.487549
S.E. of regression	2.511588	Akaike info criterion		4.732709
Sum squared resid	328.0197	Schwarz criterion		4.842199
Log likelihood	-127.1495	F-statistic		0.485643
Durbin-Watson stat	2.064920	Prob(F-statistic)		0.618064
Inverted AR Roots	-.56			
Inverted MA Roots	-.57			

**Table 9.29: Estimation of ARMA(1,1) post-August 2006**

Dependent Variable: CONTROL_MAN				
Method: Least Squares				
Sample: 2006:08 2008:07				
Included observations: 24				
Convergence achieved after 67 iterations				
Backcast: 2006:07				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.706945	0.140777	33.43553	0.0000
AR(1)	0.389715	0.199532	1.953151	0.0643
MA(1)	-0.989949	0.001420	-697.0499	0.0000
R-squared	0.260981	Mean dependent var		4.647933
Adjusted R-squared	0.190599	S.D. dependent var		3.176695
S.E. of regression	2.857969	Akaike info criterion		5.054568
Sum squared resid	171.5277	Schwarz criterion		5.201825
Log likelihood	-57.65482	F-statistic		3.708032
Durbin-Watson stat	1.904594	Prob(F-statistic)		0.041772
Inverted AR Roots	.39			
Inverted MA Roots	.99			

- 9.28 Consider Table 9.28 and Table 9.29. After estimating the models for the two separate samples, we can observe in these tables the increase in smoking prevalence (denoted by the higher value of the intercept term, C) from one year after the enforcement of the regulation. However, both the autoregressive and moving average coefficients are not significant in the pre-August model — in other words, the model for pre-August 2006 is probably not the best model, even though the methodology requires us to employ that same model. This means that the model on the pre-August 2006 sample may be misspecified, with the consequence that the Chow test would lose its reliability.
- 9.29 Our view is that the result of a structural break here, with smoking prevalence increasing from one year after the Relevant Date of the measure, is not robust.
- 9.30 The data reported give the trend, relative to the norm of British Columbia. We also tested the time series alone.



- 9.31 As discussed above, the series Gen\_Prev\_Man and Gen\_Prev\_Sas are the unadjusted data for Manitoba and Saskatchewan (i.e. no adjustment for British Columbia).
- 9.32 As discussed above, there was no trend Gen\_Prev\_Sas, but there was a trend in Gen\_Prev\_Man permitting the use of a Chow test.
- 9.33 We performed several Chow tests but we could not reject the hypothesis of a lack of structural break. The results are reported below.

**Table 9.30: Chow test at January 2005**

Chow Breakpoint Test: 2005:01			
F-statistic	0.650101	Probability	0.585493
Log likelihood ratio	2.086593	Probability	0.554630

**Table 9.31: Chow test at January 2006**

Chow Breakpoint Test: 2006:01			
F-statistic	1.125189	Probability	0.344761
Log likelihood ratio	3.576470	Probability	0.310979

**Table 9.32: Chow test at January 2007**

Chow Breakpoint Test: 2007:01			
F-statistic	1.542685	Probability	0.210984
Log likelihood ratio	4.862356	Probability	0.182158

## Conclusion

- 9.34 Overall, we believe that no robust structural break, specifically any break indicating a reduction in prevalence following the enforcement of display bans in Canada, can be identified.

## 10 APPENDIX II: CURRICULUM VITAE OF DR ANDREW LILICO

### QUALIFICATIONS

**St. John's College, Oxford**

BA (Hons) Politics, Philosophy and Economics (1989-92)

**University College, London**

MSc. Economics (1997-8)

**University College, London**

PhD. Economics (1998-02)

### CAREER DETAILS

- July 06 - EUROPE ECONOMICS, London**  
*Managing Director*
- Sep 02 - July 06 EUROPE ECONOMICS, London**  
*Managing Consultant*
- 1999 - Sep 02 UCL, London**  
*Visiting Lecturer and Teaching Assistant in Economics*
- 1999-2003 Welwyn Hatfield District Council**  
*Shadow Finance Spokesman (2001/2), Shadow Spokesman for Economic Development (2000/1)*
- 1994-99 PlasPET Group, Florida, USA**  
*Business Consultant (free-lance)*
- 1998 The Adam Smith Institute (International Division)**  
*Economic Consultant (free-lance)*
- 1997 Institute of Directors**  
*International and Public Sector Economist*
- 1992-94 Institute for Fiscal Studies, London**  
*Economist*
- 1988-89 ICI Runcorn Heath Site**  
*Mathematical Research Scientist*

## SELECTED PROFESSIONAL EXPERIENCE

### IMPACT ASSESSMENT

#### **European Commission DG Internal Market**

*The Costs of Complying with the Financial Services Action Plan (ongoing: exp completion October 2008)*

Analysis of compliance costs of a key regulatory programme of the European Union from 1998-2006.

#### **European Commission DG Enterprise**

*Impact assessment of modifications to the regime for the regulation of medical devices (2007-ongoing: exp completion 2009)*

Involved analysis of medical devices market and assessment of options for regulatory reform.

#### **European Commission DG Enterprise**

*Impact assessment of changes in chemical requirements for toys (2007)*

This project assessed the impact of proposed modifications to the EU directive on the safety of toys with a focus on the chemical content of toys.

#### **European Parliament**

*Impact of EC Financial Services Action Plan and Financial Services White Paper (December 2005 to February 2007)*

Project director for large-scale project for DG Internal Policies assessing and quantifying the impact of the EU's financial services framework on all EU Member States, both individually and collectively.

#### **FSA**

*Cost and Benefits of the FSA Training & Competence Exams Requirement (September 2006 to February 2007)*

Project director for project assessing and quantifying the costs and benefits associated with a particular FSA regulation.

#### **FSA**

*Benefits of the Markets in Financial Instruments Directive (September 2005 to April 2006)*

Project leader for project assessing and quantifying the benefits associated with a major EC directive.

**European Commission DG Transport and Energy**

*Impact of transport policies on growth and productivity in the EU (December 2005 to September 2006)*

Project leader for project, conducted for DG TREN, developing a new economic growth model and conducting an econometric study.

**European Commission DG Enterprise and Industry**

*Regulatory Impact Assessment Training (May 2004)*

Design of training course and pilot training of European Commission staff in how to conduct regulatory impact assessments.

**FSA**

*The Costs of Compliance (April to June 2003)*

Played a leading role in a major study to assess the size and drivers of incremental cost of compliance with FSA regulation since 1998.

**FSA**

*The Costs and Benefits of FSA Authorisation of General Insurance and Mortgage Intermediation (November 2002 to January 2003)*

Part of a team assessing the costs and the costs and benefits of authorisation proposals for the FSA regulation of mortgages and general insurance.

**COMPETITION**

**Association of Convenience Stores**

*Effects of the Planning System on Competition in the Retail Grocery Sector (September 2006 to November 2006)*

Project leader for preparation of submission to the Competition Commission.

**Ranbaxy**

*Assistance with legal defence in alleged cartel case (May 2004 to April 2005)*

Assisting the defence in critiquing the alleged damages in a court case alleging that generics pharmaceuticals companies colluded in the late 1990s. Approximately £400m sought. Approximately £4.5m paid.

### **MSD / LASM**

*Article 82 (June 2004)*

Competition economics analysis of impact of European Treaty article pertaining to abuse of a dominant position.

### **EFPIA**

*Parallel trade with Accession States (November 2002)*

Analysis of the effects of parallel trade in pharmaceuticals with Eastern Europe after New Member States join EU. Arguments towards a derogation on parallel trade rules in respect of New Member States.

### **PUBLIC AFFAIRS**

#### **London Chamber of Commerce and Industry**

*The Competitiveness of London (August 2007 to May 2008)*

Modelling of the competitiveness of London versus emerging threats in Dubai, Moscow, Mumbai and Shanghai. Input to LCCI submission to government on behalf of London.

#### **Wine and Spirit Trade Association**

*Budget submission (February to April 2008)*

Advocacy concerning the rate of duty on wine and spirits in the UK.

#### **Wyeth Portugal**

*Reimbursement status of Enbrel in Portugal (December 2005 to September 2006)*

Advocacy project considering the case for a change in the reimbursement status of a drug.

### **CPRE**

*Analysis of the Barker Review of Housing Supply (January to March 2004)*

Analysis of the Barker Review of Housing Supply, advocating position that proposed expansion in housebuilding there was not necessary. The final report of this study was discussed in all major quality UK press, was debated on the radio and TV (with the author interviewed several times) and featured in two UK Parliamentary debates.

### **OTHER FINANCE & FINANCIAL SERVICES**

#### **Ofwat**

*The Cost of Capital for the water industry (ongoing)*

Project assessing the cost of capital for the regulated water industry.

**CAA**

*The Cost of Capital for BAA (February 2006 to April 2008)*

Project assessing the cost of capital for the regulated entity managing the main London airports.

**FSA**

*Cost and Benefits of the FSA Training & Competence Exams Requirement (September 2006 to February 2007)*

Project director for project assessing and quantifying the costs and benefits associated with a particular FSA regulation.

**Ofcom**

*Applicability of Real Options in Regulation of third generation mobile phone termination charges (August 2006)*

**London Market Insurance Brokers' Committee**

*Status of General Insurance Intermediaries under the Financial Services Compensation Scheme (May 2006)*

Project director for advocacy project responding to an FSA consultation paper.

**Ofcom**

*Cost of Capital, Real Options (May to September 2005)*

During a full-time secondment at Ofcom, participating in a major policy statement by Ofcom on its approach to regulatory cost of capital, including being the main author of the section on the application of real options theory in regulation; assessing BT's permitted group beta; assessing the case for granting different costs of capital on different parts of BT's business.

**IEA/Sunday Times Shadow Monetary Policy Committee**

*Member (Ongoing)*

Participating in a monthly email poll and attending quarterly committee meetings to debate and vote on a recommendation for Bank of England interest rates.

**Staff Working Paper**

*Why might people take on "too much" debt? (July 2004)*

Technical paper considering under what conditions people might take on more debt than, in retrospect, they would consider ideal.

**Ofwat**

*Review of the impact of general decline in pension funds on RPI. (June 2004)*

Analysis for UK water regulator.

**Staff Working Paper**

*Regulating markets with short-sighted decision-makers? (March 2004)*

Technical paper setting out a formal economic framework within which to consider how markets are affected by shortsightedness, and how to regulate them.

**UCL**

*Lecturing (December 2003 to July 2005)*

Undergraduate lectures in Money & Banking (including Banking, Financial Regulation, Monetary Theory, and Monetary Policy) and in Corporate Finance (including Monte Carlo simulation techniques, Efficient Markets, Capital Structure, Financial Contracting, and Real Options).

**Staff Working Paper**

*The role and regulation of short selling (October 2002)*

Technical paper analysing what regulatory issues short selling raises and whether proposed regulations at the time (e.g. FSA DP17) actually addressed them.

**TAXES, BENEFITS, MACROECONOMICS, ECONOMIC DEVELOPMENT, HOUSING, INTERNATIONAL ECONOMICS**

**Association of Convenience Stores**

*Effects of the Planning System on Competition in the Retail Grocery Sector (September 2006 to November 2006)*

Project leader for preparation of submission to the Competition Commission.

**European Commission**

*Impact of transport policies on growth and productivity in the EU (December 2005 to September 2006)*

Project leader for project, conducted for DG TREN, developing a new economic growth model and conducting an econometric study.

**CPRE**

*Taxes and Development (May 2004 to September 2004)*

This project considers the impact of various tax measures on the incentives for building housing and conducting other sorts of development in the UK.

### **MSD / LASM**

*Article 82 (June 2004)*

Competition economics analysis of impact of European Treaty article pertaining to abuse of a dominant position with reference to parallel trade.

### **PhRMA**

*Briefing notes and speech preparation for European LAWGs meeting (May 2004)*

Work for European branches of US pharmaceuticals association on parallel trade.

### **CPRE**

*Analysis of the Barker Review of Housing Supply (January to March 2004)*

Analysis of the Barker Review of Housing Supply. The final report of this study was discussed in all major quality UK press, was debated on the radio and TV (with the author interviewed several times) and featured in two UK Parliamentary debates.

### **Staff Working Paper**

*When might people pay too much for their housing? (February 2003)*

Technical paper considering under what conditions people might pay more for their housing than, in retrospect, they would consider ideal.

### **EFPIA**

*Parallel trade with Accession States (November 2002)*

Analysis of the effects of parallel trade in pharmaceuticals with Eastern Europe after new Accession States join EU.

### **Welwyn Hatfield District Council**

*Councillor (1999-2003), Shadow Finance Spokesman (2001/2), Shadow Spokesman for Economic Development (2000/1), Member of Planning Committee (1999/2000), Member of Development Plan Committee (2000/1)*

Devised the 2001 & 2002 Budget responses for the Conservative Group.

Permanent Substitute on LGA Economic Regeneration Executive.

### **UCL**

*Lecturing and Teaching (1999 - Sep 02)*

Teaching Economics of European Integration to university undergraduates.



## **UCL**

### *MSc. Dissertation (1998)*

A Neo-Classical Growth model of the Romanian Economy. This was a mathematical model of a transition economy that identified the principal factors affecting the growth rate of the economy.

## **The Adam Smith Institute (International Division)**

### *Macroeconomics Consultancy (1998)*

Work for the Romanian government. Andrew produced two macroeconomic models for them. In April 1998 he forecast that the Romanian economy would contract noticeably in 1998. This countered most other forecasts at this time, including the official forecasts, which were all suggesting growth. But by June the official forecasts were projecting a 5 per cent contraction on the year.

The second model was a growth model which indicated the main factors explaining the growth performance of the Romanian economy and suggested ways in which growth might be improved.

In addition to producing these models he trained Romanian government staff in macroeconomics and the preparation of macroeconomic models.

## **Institute of Directors**

### *International and Public Sector Economist (1997)*

Economic policy analysis, responses to consultative documents, writing of Economic Comments. Main areas covered: EU Single Market, Common Agricultural Policy, Higher Education, Welfare, Local Government.

## **Institute for Fiscal Studies, London**

### *Economist (1992-94)*

Analysing the UK tax and benefit system; Modelling the impact of changes in UK taxes and benefits on the UK Budget and on individual households; Analysing poverty statistics; Econometric modelling of UK childcare; Setting up of General Household Survey dataset.

## **OTHER PHARMACEUTICALS**

### **Wyeth Portugal**

*Reimbursement status of Enbrel in Portugal (December 2005 to September 2006)*

Advocacy project considering the case for a change in the reimbursement status of a drug.

### **INFARMED**

*Redesign of Portuguese Pharmaceuticals Regulation (July 2004 to April 2005)*

Redesigning the Portuguese co-participation and pricing systems for the government pharmaceuticals regulator.

### **PhRMA**

*Briefing notes and speech preparation for European LAWGs meeting (May 2004)*

Work for European branches of US pharmaceuticals association.

### **Pfizer**

*Analysis of alternative pharmacist reimbursement schemes (January 2004)*

Analysis of alternative pharmacist reimbursement schemes.

### **Merck Sharp & Dohme**

*NHS Reforms (August 2003)*

Analysis of UK NHS reforms for an industry seminar.

### **Staff Working Paper**

*Risk-sharing pricing models in the distribution of pharmaceuticals (February 2003)*

Technical paper analysing conditions under which payment-by-results contracts for pharmaceuticals could be advantageous.

## **SOME PUBLICATIONS**

Six issues in pharmaceuticals — Economic Affairs, September 2006

Transforming the information environment in pharmaceuticals — Scrip Magazine, March 2004

The measure of inflation — Economic Affairs, March 2004

Calculated risk? — Parliamentary Monitor, November 2003

Virtuous price discrimination, pharmaceuticals, and parallel trade — Competition Law Insight, May 2003

Could deflation be ideal? — Economic Affairs, March 2003

Risk-sharing pricing models in the distribution of pharmaceuticals — Europe Economics Staff Working Paper, February 2003

When might people pay too much for their housing? — Europe Economics Staff Working Paper, February 2003

The role and regulation of short selling — Europe Economics Staff Working Paper, October 2002  
The Liquidity Trap and Price-Level Targeting — Economic Affairs, June 2002  
Ireland, The ECB, and the Maastricht Treaty — European Journal, March 2001  
US Economic Success - Is it merely a Statistical Mirage?  
— Capital Economics/Deloitte & Touche Economic Review, Dec. 2000  
A price-stabilising fuel duty — eBow Brief, October 2000  
Price-Level Targeting — Economic Affairs, June 2000  
Rover, The Euro, and What If...? — European Journal, April 2000  
When is it good to join a Customs Union? — European Journal, Midsummer 1999  
Is Cyclical Convergence a Good Thing? — European Journal, May/June 1999  
Can “Tax Competition” be harmful? — European Journal, Summer 1998  
The End of the CAP? — European Journal, February 1998  
Is money spent on students wasted? — The Independent, December 4 1997  
Does the UK need more graduates? — IoD Economic Comment, September 1997  
The Single Market - What more can be achieved? — IoD Economic Comment, August 1997  
The BBC Budget Guide 1993 — IFS, February 1993  
The IFS/Goldman Sachs Green Budget 1993 (part-author) — IFS, January 1993  
Analysis of the 1993 Budget for the Daily Telegraph