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SMOKING BAN TOPIC

About 2 weeks before their EAC, candidates were asked to research the proposed smoking ban. Smoking will be banned in all enclosed public places in England from Summer 2007. There is to be a review of the policy after three years. As part of this review, you have been asked to plan an ex post evaluation, to be carried out in 2010, to find out what the impact of this policy has been in economic terms. We advised candidates to consider a range of sources when researching this topic. In particular:

- http://www.hm-treasury.gov.uk/data_greenbook_index.htm
- www.dh.gov.uk

Technical report

At EAC candidates were asked to write a report explaining what an economic evaluation is and what you think this evaluation should take into account.

For this exercise you are encouraged to 'show-off' your knowledge, technical grasp and understanding of the relevant economics. But remember you will be tested verbally on what you write here as part of your interview! You will have just 30 minutes to write your technical report at EAC.

What is evaluation?

The Green Book states that evaluation is essentially ex post cost benefit analysis and is very similar to appraisal. There will therefore be a significant element of overlap with the economic issues we expected candidates to cover on the Sure Start topic. The main differences are that it is conducted either during or after implementation and that the results are compared against the “do nothing” option and against target or alternative outturns. Good candidates will note the need to compare to such a counterfactual and that the counterfactual does require ‘forecasting’ what would have happen in the absence of the ban or an alternative regime.

A passing answer will need to cover:

- Clarifying the objectives of the policy, the difficulty of establishing the counterfactual, measuring and valuing the benefits and costs of the policy, discounting to allow for the fact that benefits and costs spread through time.

Objective of the policy

To reduce illness and premature death caused by smoking among both smokers and non-smokers. This is to be achieved both by reducing the exposure of non-smokers to
second-hand smoke and by helping smokers to quit. The main rationale for the legislation was to protect non-smokers.

A good answer would include some of the available evidence about the magnitude of the problem. For instance, it is estimated that smoking causes some 106,000 premature deaths every year in the UK.

In economic terms, reducing exposure of non-smokers to second-hand smoke helps to correct a negative externality - that is, a smokers' decision to smoke imposes a cost on others. The ban on smoking in public places is expected to help 'correct' for these market failures.

A Coase solution would be for smokers to compensate non-smokers or vice versa. In this sense a ban is unlikely to produce a Pareto efficient level of enclosed space smoking. But such a market based solution would itself be unlikely to be efficient resulting in ’market failure’ - that is, Pareto inefficiency. This is because smokers and non-smokers are not well informed of risks and they do not themselves pay for the medical consequences of their actions. It would also be impractical as enforcement and arranging payments, for example, many would feel that smokers and non-smokers should not be able to trade health for money.

We already attempt to internalise the external cost through taxation, but the effectiveness of this approach is limited by inelastic demand and smuggling of tobacco.

A good candidate might also extend the merit good argument for intervention. Smokers derive utility from smoking, but mainly because they are addicted. We may consider this utility undesirable, and because of the health effects, feel justified in reducing opportunities to smoke.

**Measuring the impact of the policy**

A passing answer should highlight the need to collect data both before the policy is implemented (the baseline) and then again after a certain period. Data collection needs to be built in at the early stages of policy design. (Then forecast for the counterfactual; for example, based on trends without the policy.

The problem of defining the counterfactual must also be covered. How are we to judge for evaluation purposes how much of any future decline in smoking is attributable to the ban and how much would have happened anyway? It is important to look at recent trends. We know that smoking rates have been falling in recent years, due at least partly to other policies, which will remain in place when the ban is introduced. Smoking prevalence among those aged 16 and over in England fell from 28% in 1998 to 25% in 2003, and the proportion of respondents to an ONS survey who smoked on average 20 or more cigarettes a day fell from 14 per cent of men in 1990 to 9 per cent in 2004/05 and from 9 per cent of women to 6 per cent.

This is a national policy that is not being piloted, so it is difficult to identify a control group or to create a comparator group through sophisticated statistical techniques. At this level, we should not expect discussion of statistical techniques, though a good
candidate might be able to cover some of this material (and defend it orally). At a simple level, for example, it might be possible to use data on past changes in smoking to forecast what might happen in the future without the ban. The actual outcome with the ban could then be compared with this forecast to estimate the impact of the ban.

It would be reasonable to suggest comparisons between Scotland, Wales and England, given that Scotland has already introduced a ban and Wales is likely to do so before England. When it comes to impact on the hospitality industry, for example, there might also be scope to look at cities such as Newcastle, which are close to the border: did the hospitality industry benefit on the English side of the border when the Scottish ban was introduced? It might also be possible to look at pubs with gardens: are takings higher in good weather, when smokers can smoke outside in comfort (and if so, is the size of the difference between takings in good and bad weather significantly different from what was before the ban was introduced?).

Benefits of the ban

There are four main categories of benefit that need to be identified, measured and if possible valued:

1. Health benefits

To non-smokers

This is the main objective of the ban. The benefits to non-smokers’ health (reduction in the externality) depend on the size of reduction in exposure. The main health effects of second-hand smoking are increases in heart disease, lung cancer, asthma and Sudden Infant Death Syndrome. We would expect reductions in these outcomes to take many years to be fully observed, but it is possible to measure exposure to second hand smoke (an output) more directly - for example, by measuring cotinine in the blood of bar staff. This would need to be measured before and after the ban was implemented. Ideally, a relationship between cotinine levels and disease would then be used to estimate impact on morbidity and mortality.

There could be unintended consequences: will some smokers opt to stay at home and hence expose children to more second-hand smoke? (Half of children live in a household with at least one smoker.) This could be picked up by surveys of smokers before and after the ban.

To smokers

The benefits to smokers’ health depend on the reduction in smoking by those who continue to smoke and by quitters. Again, any measured reduction in smoking could be translated into reductions into smoking-related illness and death.

2. Resource savings to NHS (if any)

These result from the reduction in the need to treat people for diseases caused by smoking. This could be estimated from the reductions in morbidity and mortality calculated above. It is important to bear in mind that people who do not die of
smoking-related causes will eventually die of something else instead. This may be just as expensive to the NHS, or even more so, but if illness is delayed then the NPV will be reduced by having a positive discount rate.

A good candidate might have picked up the fact that a reduction in active smoking might actually lead to an increase in NHS spending. The latest findings, from the Netherlands, show that smokers actually use less healthcare over their lifetime than non-smokers. They use more care per annum, but die younger. The resource implications of reductions in passive smoking are less clear, but we should accept answers that say there will be savings.

3. **There may be savings to employers from reduced sickness absence and higher productivity (fewer smoking breaks).**

The value of these could be calculated.

4. **Reductions in fire risk and damage from smoke**

**Valuing the benefits**

It is quite straightforward to express benefits 2), 3) and 4) listed above in terms of money. The health benefits present more difficulty. A good candidate might be able to explain that this could be done in terms of quality-adjusted life-years (QALYs) gained, which could then be valued at £25,000-30,000 each (the NICE threshold for NHS funding of new medicines and technologies). For increases in life expectancy, the DfT value of around £1.25m per life could be used (a good candidate might point out that the remaining life expectancy for those who die of smoking-related illness is typically lower than for those who die in transport-related accidents and so the value should be reduced correspondingly).

**Costs of the ban**

1. **Costs of the policy to the taxpayer**

**Enforcement measures**

The resource costs of whatever measures had been put in place to police and ensure compliance with the ban could be measured.

**Loss of tax revenue**

A reduction in smoking overall will, other things being equal (see below), lead to a loss of excise revenue to the exchequer. This loss is directly proportional to the size of the reduction in tobacco consumption (though we might need to take into account the effects of illicit tobacco – if cigarettes smoked in pubs are more likely not to be duty paid, then the reduction in revenue will be smaller than otherwise). We treat this as simply a transfer from exchequer to individuals, but a good candidate could raise various issues. We assume any money not spent on tobacco will be spent elsewhere in the economy. This means it will be taxed at 13% on average rather than around 80%, so the total deadweight loss from taxation will be reduced. But there might also be
offsetting welfare effects of a change in the balance between public and private spending.

A good candidate should be able to point out that the revenue lost from reduced tobacco sales will simply be replaced by greater taxation of something else. Taxation of tobacco is well accepted by the public because of the externalities and merit good characteristics of smoking, but the replacement tax might be less well tolerated. And if it is on something where elasticities of demand and supply are greater, the distortion caused by the taxation will be greater.

A good candidate might also consider whether reduced consumption of alcohol might lead to a further loss of tax revenue. This will depend on whether people drink less in pubs (see below) and on whether they drink more at home. Drinking more at home will reduce tax revenue because a given amount of alcohol purchased for home consumption tends to cost less than the same amount purchased in a pub. Since VAT is an ad valorem tax, the amount paid on alcohol drunk at home will tend to be less (though this may be offset by more drinking at the lower price). The excise duty, being a specific tax, will be the same in both cases.

2. Costs to businesses

There could be losses to the hospitality industry, though evidence from some other bans suggests that business improves under a ban. It could be argued that the factors of production used in this industry are not very specialised and so can easily be switched into other uses if profitability declines.

3. Costs of the policy to smokers

Those who would like to smoke in pubs but are prevented from doing so will suffer a reduction in utility. On the other hand, those who wanted to quit and are helped to do so by the ban should experience an increase in utility over time.

4. Unintended costs

These include such costs as increases in morbidity and mortality, especially among children, resulting from diverting smoking out of public places and into the home.

Discounting

This is very important, since we would expect the effects of the policy to extend into the future. The evaluation should look at the NPV of costs and benefits. If the NPV is positive, the ban was successful in economic terms.

A good candidate might point out that in fact, the main benefits of the ban are unlikely to be realised by 2010, when this evaluation is to be carried out. Indeed, the Scottish RIA states that the full effects of reduced exposure to second-hand smoke may take up to 30 years to be realised. A creative candidate might suggest that it would be possible to carry out a rough forecast of future benefits in 2010 based on measured levels of compliance with the ban. This could then be compared with forecasts of the counterfactual.
Some benefits are immediate but other benefits are delayed and over a long time horizon. For long benefit cost streams the NPV of the programme is very sensitive to the discount rate used; as discount is compounded, higher rates greatly reduce the NPV of long-term future benefits:

\[ NPV = \sum_{i=1}^{\infty} \frac{(B_i - C_i)}{(1 + r)^i} \]

where \( B_i = \text{benefit in year } i, \ C_i = \text{cost in year } i, \ r = \text{discount rate} \)

For most public sector investments the minimum discount to be used is 3.5%. This is an estimate of the 'Social Time Preference Rate' (STPR) - that is, the value society attaches to present, as opposed to future, benefits. It is calculated from the rate at which individuals discount future consumption over present consumption plus the product of estimates for the annual growth in per capita consumption times the elasticity of marginal utility of consumption with respect to utility.

Where NPV is calculated over more than 30 years the Green Book stipulates a declining discount rate (tables are provided). This reflects:

- increasing uncertainty over longer time horizons
- empirical evidence that people use ‘hyperbolic’ discounting over the longer term
- as the dominator in the NPV Equation is compounded/exponential, it would effectively disenfranchise future generations if it was constant at 3.5%.

**Distributional effects**

A good answer might also consider the fact that those in the lowest socioeconomic groups are more likely to smoke and so are likely both to suffer the greatest loss of utility and potentially to benefit the most in health terms from the policy. Would we consider it a regressive policy? What would be the overall impact on health inequalities?

**Example of a 'borderline fail' technical paper**

Smoking is dangerous for others and should be discouraged where passive smoking would result. Passive smoking is an externality and therefore should be reduced. That is what the ban seeks to do.

It will reduce smoking related illness and hence save the health service money. This is offset, however, by the loss of tax revenues from tobacco. People tend to accept that they should pay tax on tobacco. Also if smokers go to pubs less there will be a loss of excise duty from the sale of alcohol. The revenue could be raised by other taxes but this may be unpopular and as smokers are addicts have more distortion for the economy. Higher income tax for example may discourage work and investment.

There will be other benefits such as higher productivity from people having better health i.e. being more active and having less days off work.
On the other hand, fewer and fewer people now smoke anyway, so it may not be all down to the ban. Really you should compare the effects of the ban with what would have happened without it. It is not always easy to know what would have happened though; other than by projecting current trends, but other things might have affected these trends. You can't know. So it’s not possible to be 100 per cent accurate of the extent of costs and benefits.

A bad outcome might be if smokers with children start to smoke more at home. A child has longer to live, and so the value of their lives is greater than for adults, especially if smoking reduces the quality of life. But the benefits of reducing smoking and passive smoking may not show up by 2010. So 2010 may give a good picture of changes in behaviour but not the long-term benefits. Against this, benefits far in the future are not worth as much as benefits today.

Even if the economics doesn't add-up as a justification for the ban, there is a moral question. Smoking is irrational and this justifies the government intervening.

Note:

The main weakness of this answer is that it has no discussion of measuring and evaluating the benefits against the costs. NPV and discounting are merely alluded to. On the other hand, it does make several important points, some more clearly than others, about factors that should be considered.

Example of a 'clear pass' technical paper

What is evaluation?

Evaluation is used to decide whether something has been worthwhile. It is cost-benefit analysis carried out during or after implementation. It compares the results of a policy such as the smoking ban to what was expected when it was designed and to what would have happened if it had not been implemented.

What should such an evaluation take into account?

1. Objectives of the policy

The main objective of the ban is to improve the health and life expectancy of non-smokers by protecting them from second-hand smoke. A secondary objective is to help smokers to quit, and hence improve their health and life expectancy, by reducing their opportunities to smoke and making it less socially acceptable.

In economic terms, reducing exposure to second-hand smoke helps to correct a negative externality. People who smoke in enclosed public places impose a cost on non-smokers in terms of poorer heath. We already attempt to internalise the external cost of smoking through tobacco taxation, but the effectiveness of this approach is limited by inelastic demand and smuggling of tobacco.

As well as efficiency arguments for intervening to reduce smoking in enclosed public places, there is also a merit good justification. Smokers derive utility from smoking,
but mainly because they are addicted. We may consider this utility undesirable, and because of the health effects, feel justified in reducing opportunities to smoke.

2. Measuring the impact of the ban

In order to measure the impact of the ban in 2010, it will be necessary to have baseline data from before the ban is implemented. The evaluation design should therefore include collection of data on the main variables before summer 2007.

We also need to be able to establish how much of any decline in smoking and exposure to second-hand smoke between 2007 and 2010 is actually attributable to the ban. We know that smoking rates have been falling in recent years and that this has been at least partly due to other policies, which will remain in place when the ban is introduced. We might therefore expect a further decline between 2007 and 2010 even without the ban. Because the ban is to be implemented nationwide and is not being piloted, it is difficult to identify a control group or to create a comparator group through statistical techniques.

One way to address this problem would be to use data on past changes in smoking to forecast what might happen in future without the ban. The actual outturn with the ban could then be compared with this forecast to estimate the impact of the ban. This will not give a precise answer, but will give some indication of the net effect of the ban.

3. Benefits of the ban

Health benefits to non-smokers

The main health effects (outcomes) of reducing second-hand smoking, such as reductions in lung cancer, will take many years to be fully observed, but it is possible to measure exposure to second hand smoke (an output) more directly, e.g. by measuring cotinine in the blood of bar staff. This would need to be measured before and after the ban was implemented. Ideally, a relationship between cotinine levels and disease would then be used to estimate impact on morbidity and mortality. Putting a monetary value on health benefits is difficult. For increases in life expectancy, the DfT value of a prevented fatality of around £1.25m per life could be used, but since the remaining life expectancy for those who die of smoking-related illness is typically lower than for those who die in transport-related accidents, the value should be reduced correspondingly.

Health benefits to smokers

Any measured reduction in smoking could be translated into reductions into smoking-related illness and death.

Resource savings to the NHS

These result from the reduction in the need to treat people for diseases caused by smoking. This could be estimated from the reductions in morbidity and mortality calculated above. It is important to bear in mind that people who do not die of smoking-related causes will eventually die of something else instead. This may be just
as expensive to the NHS, or even more so, but if illness is delayed then the NPV will be reduced by having a positive discount rate.

**Savings to employers**

There may be savings from reduced sickness absence and higher productivity (fewer smoking breaks).

**Reductions in fire risk and damage from smoke**

**4. Costs of the ban**

**Costs to the taxpayer of enforcement measures**

The resource costs of whatever measures had been put in place to police and ensure compliance with the ban could be measured.

**Costs of compensating for loss of tobacco tax revenue**

A reduction in smoking overall will, other things being equal, lead to a loss of excise revenue to the exchequer. This revenue will need to be replaced from another source. Taxation of tobacco is well accepted by the public because of the externalities and merit good characteristics of smoking, but the replacement tax might be less well tolerated. And if it is on something where elasticities of demand and supply are greater, the distortion caused by the taxation will be greater.

**Costs to businesses**

There could be losses to the hospitality industry, though evidence from some other bans suggests that business improves under a ban.

**Costs of the policy to smokers**

Those who would like to smoke in pubs but are prevented from doing so will suffer a reduction in utility. On the other hand, those who wanted to quit and are helped to do so by the ban should experience an increase in utility over time.

**Unintended costs**

If the ban diverts smoking out of public places and into the home, there may be increases in morbidity and mortality among children.

**Discounting**

This is very important, since we would expect the effects of the policy to extend into the future (up to 30 years has been suggested in Scotland). The evaluation should look at the NPV of costs and benefits. If the NPV is positive, the ban was successful in economic terms.
The recommended discount rate for most public sector investments is 3.5%. This is an estimate of the 'Social Time Preference Rate' (STPR) - that is, the value society attaches to present, as opposed to future, benefits.