Price-based measures to reduce alcohol consumption

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Introduction

- Governments long been concerned about excess alcohol intake
- Excise taxes have been main price-based intervention to date
  - annual real-terms increases since 2008, planned to 2014
- Recent consideration of alternative policies:
  1. Minimum unit price (MUP)
     - floor price based on alcohol content
     - 1 unit = 10ml alcohol
  2. Banning quantity-based alcohol promotions
     - prohibit multi-buy deals, discounts on multi-packs
Current analysis: preliminary findings

- We compare the effectiveness of different price-based policies:
  - MUP of 45p
  - quantity discount ban
  - reformed excise tax system targeting alcohol strength
- We use detailed longitudinal household off-trade purchase data
- Make simple assumptions about behavioural responses and ask:
  - are policies well-targeted on ‘problem’ drinkers?
  - what are the implications for spending, tax revenue, firm revenue?
- Our results so far suggest that:
  - tax reform would be better-targeted than MUP
  - tax reform also raises revenue for government, not industry
  - quantity discount bans are very poorly-targeted

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Outline structure

• Background
  – data on alcohol intake, prices and affordability
  – brief recap on economic rationale for different reforms

• Methods
  – dataset for analysis
  – descriptive figures for off-trade alcohol purchasing behaviour
  – description of policy reforms analysed
  – assumptions about demand- and supply-side responses

• Results
  – descriptive analysis of quantity discount ban
  – comparative analysis of effect of MUP and excise tax reform

• Conclusions, limitations and future plans
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Intake trend differs in UK from near-neighbours
Average intake of alcohol (litres per adult), 1970 to 2010

Source: OECD Health Statistics 2012
Real alcohol price flat, but on/off differential
Relative alcohol price indices, 1990 to 2012

Source: Calculated from ONS Retail Prices Index data
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Alcohol affordability has recently fallen back
Real alcohol prices and real incomes, 1990 to 2012

Source: Calculated from ONS Retail Prices Index data and average earnings data.
Note: average earnings and affordability indices are 12-month moving averages.

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Rationale for price-based intervention

- Excess alcohol intake generates external costs
  - crime, anti-social behaviour, family problems
  - public costs of treating health harms, productivity spillovers
  - time inconsistency could generate externalities for future self

- Effective interventions depend on:
  - targeting ‘problem’ drinking: price according to marginal externality
    - varies across drinkers and drinks
    - may not be able to target high cost consumption directly
  - response to price changes
    - does demand for high cost units fall as price rises?
    - how do firms respond to intervention?

- Optimal policy needs to trade-off benefits from reducing problem consumption against costs of reducing low-cost consumption
Our analysis

• We explore whether policies effectively target heavy drinkers
  – average weekly intake above recommended levels
  – drinking small amounts unlikely to generate external costs
• Other drinking habits may also be of policy concern
  – binge drinking, under-age drinking
  – we do not have data on this specifically but interesting to explore
• Different reforms effectively targeted if heavy drinkers tend to:
  – buy cheap alcohol (minimum pricing)
  – buy strong alcohol (tax reform)
  – buy in bulk (quantity discount ban)

• We do not directly estimate price responsiveness to policy
  – assume values drawing on literature
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Data

• Market research in home scanner data from Kantar Worldpanel
  – GB household-level panel, sample size c. 25,000
  – households can drop out at any time, mean duration c. 2 years
  – demographics recorded at sign up, update approx. every 9 months

• Records each item purchased on each trip at barcode level
  – price matched in from till receipts, includes deal information
  – calculate ABV % from data, online sources and ONS
  – use HMRC data to match in excise tax levied on each purchase

• Use 52 weeks from Nov 2009 to Oct 2010
  – select sample of households who report spending consistently
  – 21,542 hhs (median: 301 day duration), 522,125 alcohol purchases

• Calculate units purchased per adult per week for each household
Data

• Data weighted so that observed spending in sample matches total off-trade spending from ONS National Accounts
  – lines up well with tax and quantity data from HMRC by alcohol type

• Key strengths
  – long observation period: purchases should approximate intake
  – large sample size
  – detailed purchase and price information

• Key weaknesses
  – no on-trade purchases
  – household-level not individual-level data
  – purchase not consumption (cannot measure e.g. bingeing)
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Alcohol purchase behaviour by intake level
Grouped by average off-trade units per adult per week

<table>
<thead>
<tr>
<th>Units</th>
<th>N</th>
<th>%</th>
<th>Litres of drink per adult/week</th>
<th>Avg. strength (ABV)</th>
<th>Avg. pence per unit</th>
<th>% units on quantity discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤7</td>
<td>16,427</td>
<td>76%</td>
<td>0.2</td>
<td>10.5%</td>
<td>45.4</td>
<td>17.0%</td>
</tr>
<tr>
<td>&gt;7, ≤14</td>
<td>2,586</td>
<td>12%</td>
<td>1.1</td>
<td>11.0%</td>
<td>42.5</td>
<td>16.1%</td>
</tr>
<tr>
<td>&gt;14, ≤21</td>
<td>1,103</td>
<td>5%</td>
<td>1.8</td>
<td>12.3%</td>
<td>41.4</td>
<td>14.5%</td>
</tr>
<tr>
<td>&gt;21, ≤35</td>
<td>898</td>
<td>4%</td>
<td>2.7</td>
<td>12.9%</td>
<td>39.5</td>
<td>13.7%</td>
</tr>
<tr>
<td>&gt;35</td>
<td>528</td>
<td>2%</td>
<td>4.9</td>
<td>14.3%</td>
<td>37.5</td>
<td>11.5%</td>
</tr>
</tbody>
</table>

- NHS guidelines for ‘hazardous’ drinking:
  - 14+ units per week (6+ in one session) for women
  - 21+ units per week (8+ in one session) for men

- Our figures suggest 6 to 11% of households ‘hazardous’ on basis of average off-trade consumption
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Minimum unit price

- Home Office has recommended a 45p MUP for England & Wales
  - policy currently under consultation
- Scottish government has legislated for a 50p MUP
  - implementation delayed pending a legal challenge
- We assess the impact of a 45p MUP across Britain
  - assume the 45p rate was applicable in April 2012
  - assume rate uprated each year in line with excise duties
  - thus we actually simulate rates of 38p and 40p
  - change applies on 29 March 2010 when excise taxes rose
MUP affects majority of off-trade units
Proportion of units below simulated MUP by alcohol type, 2010

<table>
<thead>
<tr>
<th>Alcohol Type</th>
<th>% of units below MUP</th>
<th>Avg. pence per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cider</td>
<td>81.2</td>
<td>28.1</td>
</tr>
<tr>
<td>Spirits</td>
<td>40.6</td>
<td>40.6</td>
</tr>
<tr>
<td>Beer</td>
<td>38.7</td>
<td>38.7</td>
</tr>
<tr>
<td>Wine</td>
<td>45.5</td>
<td>45.5</td>
</tr>
<tr>
<td>Alcopops</td>
<td>81.2</td>
<td>81.2</td>
</tr>
<tr>
<td>All</td>
<td>51.4</td>
<td>51.4</td>
</tr>
</tbody>
</table>

Source: Calculated from Kantar Worldpanel 2010 data. MUP applied is 38p, rising to 40p from 29/3/10.

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Reforms to alcohol excise taxes

• Excise taxes are specific, vary by alcohol type and strength
  – raise around £10 billion, just under 2% of receipts
• Broad structure governed by EU Directive (92/83/EEC)
  – beer, spirits taxed by alcohol content
  – wine, cider taxed by volume of product (within strength bands)
Baseline alcohol excise tax structure, 2009/10
Excise duty rate per alcohol unit, by type and strength

Source: Calculated from HMRC data.
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Reforms to alcohol excise taxes

- Taxes do not look well-targeted on strong alcohol
- We consider more radical reform in which tax is levied on alcohol content directly for all alcohol types
- Examine three possibilities:
  - tax all units of alcohol equally
  - vary rate by type but not strength
  - vary rate by type, rate increases with strength

Note: These rates applied before April 2010. We assume rates then rise in line with actual duties.
Reformed alcohol tax structures, 2009/10
Simulated excise duty rates per alcohol unit, by type and strength
Reforms to alcohol excise taxes

• Taxes do not look well-targeted on strong alcohol
• We consider more radical reform in which tax is levied on alcohol content directly for all alcohol types
• Examine three possibilities:
  – tax all units of alcohol equally
  – vary rate by type but not strength
  – vary rate by type, rate increases with strength
• The particular rates we choose are designed to achieve same aggregate reduction in units as the MUP simulation
  – impact across households and on revenues will differ
• Aim is not to suggest these particular reforms are ‘optimal’
  – want to compare to MUP on basis they achieve a common outcome
Quantity discount ban

- Implemented in Scotland (off-trade) in October 2011
- Under consultation in England and Wales
- Policy applies to:
  - quantity-based special offers (BOGOF, 3F2, 5% off 6 bottles, etc.)
  - bulk discount of given container size/brand combination (single 500ml can = £1, 24-pack ≥ £24) *if* smaller pack available in-store
- Policy does not apply to:
  - price-based special offers (50% off), extra free offers
  - bulk discount across container sizes (2-litre bottle costs less than 2×1-litre bottle)
- We describe importance of quantity discounts and large multi-packs in alcohol purchases of each household
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Assumed responses to policy interventions

• **Demand-side**
  - assume all consumers have alcohol price elasticity of -0.5
    - central figure in Wagenaar et al. (2009) meta-analysis of 112 studies
  - calculate policy-induced change in avg. price for each household
  - apply elasticity at the household level
  - no wider demand-side responses
    - e.g. cross price effects between alcohol and other consumption

• **Supply side**
  - assume firms are essentially passive
  - changes in excise tax are fully passed into final prices
  - prices below MUP are raised to threshold, no other price changes
  - no impact on product range, advertising and promotion etc.
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## Multibuy deals in off-trade alcohol (% units)
By purchase level and alcohol type, 2010 data

<table>
<thead>
<tr>
<th></th>
<th>Beer</th>
<th>Cider</th>
<th>Wine</th>
<th>Fabs</th>
<th>Spirits</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 7 units</td>
<td>25.9</td>
<td>22.8</td>
<td>16.1</td>
<td>23.8</td>
<td>4.5</td>
<td>17.0</td>
</tr>
<tr>
<td>≤ 14 units</td>
<td>24.6</td>
<td>18.7</td>
<td>17.1</td>
<td>23.6</td>
<td>4.4</td>
<td>16.1</td>
</tr>
<tr>
<td>≤ 21 units</td>
<td>23.4</td>
<td>17.9</td>
<td>16.2</td>
<td>18.7</td>
<td>3.5</td>
<td>14.5</td>
</tr>
<tr>
<td>≤ 35 units</td>
<td>21.9</td>
<td>17.5</td>
<td>16.3</td>
<td>19.1</td>
<td>3.3</td>
<td>13.7</td>
</tr>
<tr>
<td>&gt; 35 units</td>
<td>17.7</td>
<td>22.1</td>
<td>14.4</td>
<td>14.5</td>
<td>2.3</td>
<td>11.5</td>
</tr>
<tr>
<td>All</td>
<td>23.4</td>
<td>20.2</td>
<td>16.0</td>
<td>22.0</td>
<td>3.5</td>
<td>14.6</td>
</tr>
</tbody>
</table>

Source: Calculated from Kantar Worldpanel
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## Multipacks in off-trade alcohol

Average ‘items per pack’, by purchase level and alcohol type, 2010 data

<table>
<thead>
<tr>
<th></th>
<th>Beer</th>
<th>Cider</th>
<th>Wine</th>
<th>Fabs</th>
<th>Spirits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>≤ 7 units</strong></td>
<td>6.1</td>
<td>2.5</td>
<td>1.0</td>
<td>1.9</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>≤ 14 units</strong></td>
<td>6.8</td>
<td>2.8</td>
<td>1.0</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>≤ 21 units</strong></td>
<td>6.9</td>
<td>2.9</td>
<td>1.0</td>
<td>1.8</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>≤ 35 units</strong></td>
<td>7.2</td>
<td>2.8</td>
<td>1.0</td>
<td>1.7</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>&gt; 35 units</strong></td>
<td>6.2</td>
<td>2.5</td>
<td>1.0</td>
<td>1.6</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td>6.5</td>
<td>2.7</td>
<td>1.0</td>
<td>1.8</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*Source: Calculated from Kantar Worldpanel*

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# Typical ‘item size’ in off-trade alcohol

Avg. bottle/can size (mls), by purchase level and alcohol type, 2010 data

<table>
<thead>
<tr>
<th></th>
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<th>Cider</th>
<th>Wine</th>
<th>Fabs</th>
<th>Spirits</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 7 units</td>
<td>437</td>
<td>831</td>
<td>746</td>
<td>458</td>
<td>719</td>
</tr>
<tr>
<td>≤ 14 units</td>
<td>443</td>
<td>1,077</td>
<td>788</td>
<td>495</td>
<td>762</td>
</tr>
<tr>
<td>≤ 21 units</td>
<td>452</td>
<td>1,171</td>
<td>825</td>
<td>427</td>
<td>768</td>
</tr>
<tr>
<td>≤ 35 units</td>
<td>449</td>
<td>1,409</td>
<td>874</td>
<td>457</td>
<td>795</td>
</tr>
<tr>
<td>&gt; 35 units</td>
<td>455</td>
<td>1,513</td>
<td>1,000</td>
<td>457</td>
<td>853</td>
</tr>
<tr>
<td>All</td>
<td>445</td>
<td>1,126</td>
<td>828</td>
<td>460</td>
<td>778</td>
</tr>
</tbody>
</table>

Source: Calculated from Kantar Worldpanel
Quantity discount ban: key points

- **Policy seems badly-targeted:**
  - heavy drinkers do not rely more heavily use of multibuys
    - have not yet looked at variation in type or ‘size’ of offers used
  - heavy drinkers do not buy larger multi-packs
  - heavy drinkers buy larger containers, but not affected by policy

- **Supply-side response means policy need not raise prices:**
  - increase use of price discounts (£3.33 per bottle, not 3 for £10)
  - reduce price of small packages
    - both allow people to obtain lower unit price at lower quantity – could be beneficial
  - remove small packages from sale
    - limit ability to obtain small quantities – could be harmful
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- **Conclusions, limitations and future plans**
Consumption response to reforms
Average of household-level responses, by intake group

Units per adult per week

<table>
<thead>
<tr>
<th>Intake Group</th>
<th>Avg. consumption change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 7</td>
<td>-1</td>
</tr>
<tr>
<td>≤ 14</td>
<td>-2</td>
</tr>
<tr>
<td>≤ 21</td>
<td>-3</td>
</tr>
<tr>
<td>≤ 35</td>
<td>-4</td>
</tr>
<tr>
<td>&gt;35</td>
<td>-5</td>
</tr>
</tbody>
</table>

Source: Calculated from Kantar Worldpanel. Note: excludes abstainers.

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Distributional issues
Effect on household grocery budgets, by income and intake group

% increase in grocery budget

Gross annual household income group

Source: Calculated from Kantar Worldpanel. Note: excludes abstainers.
Aggregate effects

<table>
<thead>
<tr>
<th></th>
<th>Off-trade units (bn)</th>
<th>Alcohol spending (£ bn)</th>
<th>Tax revenue duty+VAT (£ bn)</th>
<th>Firm revenue (£ bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>37.04</td>
<td>15.33</td>
<td>8.95</td>
<td>6.39</td>
</tr>
<tr>
<td><strong>Change due to policy reform:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MUP</td>
<td>-2.40</td>
<td>+0.55</td>
<td>-0.29</td>
<td>+0.84</td>
</tr>
<tr>
<td></td>
<td>(-6.5%)</td>
<td>(+3.6%)</td>
<td>(-3.3%)</td>
<td>(+13.2%)</td>
</tr>
<tr>
<td>Single tax rate</td>
<td>-2.39</td>
<td>+0.65</td>
<td>+1.04</td>
<td>-0.39</td>
</tr>
<tr>
<td></td>
<td>(-6.5%)</td>
<td>(+4.3%)</td>
<td>(+11.6%)</td>
<td>(-6.0%)</td>
</tr>
<tr>
<td>Type-varying tax</td>
<td>-2.41</td>
<td>+0.75</td>
<td>+1.15</td>
<td>-0.40</td>
</tr>
<tr>
<td></td>
<td>(-6.5%)</td>
<td>(+4.9%)</td>
<td>(+12.9%)</td>
<td>(-6.3%)</td>
</tr>
<tr>
<td>Type-strength tax</td>
<td>-2.40</td>
<td>+0.64</td>
<td>+0.98</td>
<td>-0.34</td>
</tr>
<tr>
<td></td>
<td>(-6.5%)</td>
<td>(+4.2%)</td>
<td>(+11.0%)</td>
<td>(-5.4%)</td>
</tr>
</tbody>
</table>

Source: Calculated from Kantar Worldpanel.
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Summary of policy impacts

• MUP equivalent to 45p in 2012 prices
  – average impact roughly 2×bigger for heavy drinkers than light
  – mildly regressive
  – generates windfall of around £840m for industry
  – loss of around £290m in tax receipts (duty -£370m, VAT +£80m)

• Excise tax reform targeting stronger alcohol
  – average impact roughly 3×bigger for heavy drinkers than light
  – mildly regressive
  – reduces industry revenue by around £340 million
  – generates around £980m in tax receipts (duty +£890m, VAT +£90m)
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Conclusions

• Quantity discount ban poorly targeted and may well have limited price effect – does not seem like a good policy
• MUP often seen as more targeted than increase in excise duty
• But *reform* of duty targeting strong alcohol even better-targeted
  – and would raise tax revenue rather than give industry a windfall
• European dimension important …
  – EU Directive prohibits reform of alcohol taxes as we suggest
  – government should lobby for necessary reform to allow tax change
  – MUP legality under EU Directives?
Further analysis

• Allow elasticity to vary across alcohol types and intake level
  – draw on literature and meta-analysis
    • relatively consistent variation by type (e.g. beer more elastic)
    • less clear how elasticities vary across intake group
  – estimate off-trade demand model using Worldpanel data

• Relax assumption of passive firm responses
  – allow firms to re-optimise
    • wider price responses, product choices, advertising and promotion strategies
  – make particular assumptions or try to model explicitly