Basic concepts in the economics of tobacco control I

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Avec le support et le financement de
Basic concepts (Demand and Supply)
Demand

- Different combinations of the price and the quantity that people are willing and able to buy, during a specific period of time, given their incomes and tastes and preferences.
### A hypothetical example

<table>
<thead>
<tr>
<th>Price per pack of cigarettes (Rand/pack)</th>
<th>Quantity demanded</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1100</td>
</tr>
<tr>
<td>25</td>
<td>1000</td>
</tr>
<tr>
<td>50</td>
<td>900</td>
</tr>
<tr>
<td>75</td>
<td>800</td>
</tr>
<tr>
<td>100</td>
<td>700</td>
</tr>
<tr>
<td>125</td>
<td>600</td>
</tr>
<tr>
<td>150</td>
<td>500</td>
</tr>
<tr>
<td>175</td>
<td>400</td>
</tr>
<tr>
<td>200</td>
<td>300</td>
</tr>
</tbody>
</table>
Presenting this graphically
Some comments

• Demand curve graphically presents the relationship between demand and price
  – This is a negative relationship

• Can the demand curve shift?

• Distinguish between a shift of the demand curve and a movement along the demand curve
Shifting the demand curve

- The demand curve shifts if any of the following changes:
  - Tastes and preferences
  - Income
  - Advertising
  - Price of substitute goods
  - (and other things)
Shifting the demand curve graphically

- Demand 0
- Demand 1
- Demand 2

Price

100

Quantity

700
Some examples

Consider the demand for cigarettes. What will happen to the demand curve if the following things happen?

- Tobacco advertising is banned
- Indoor smoking is banned
- The government increases the excise tax on cigarettes
Supply

• Different combinations of the price and the quantity that **producers** are willing to produce in a particular period

• As the price increases producers typically want to produce more
  – Desire for extra profit
  – Need to pay the additional resources more
## A hypothetical example

<table>
<thead>
<tr>
<th>Price per pack of cigarettes (Rand/pack)</th>
<th>Quantity supplied</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>75</td>
<td>0</td>
</tr>
<tr>
<td>100</td>
<td>300</td>
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<td>600</td>
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<tr>
<td>150</td>
<td>900</td>
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<tr>
<td>175</td>
<td>1200</td>
</tr>
<tr>
<td>200</td>
<td>1500</td>
</tr>
</tbody>
</table>
Presenting this graphically
Movements of the supply curve

• Why would the supply curve shift?
  – Changes in costs of production
  – Imposition of a tax
  – Number of suppliers
  – (others)

• Distinguish between a shift of the supply curve and a shift along the supply curve
Combining the two concepts

- Demand is determined by the consumers
- Supply is determined/controlled by the producers
- The interaction of these two forces yields **market equilibrium**
- At equilibrium we derive the price and equilibrium quantity
### Combining the hypothetical demand and supply curves

<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity demanded</th>
<th>Quantity supplied</th>
<th>Shortage or surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1100</td>
<td>0</td>
<td>1100 (shortage)</td>
</tr>
<tr>
<td>25</td>
<td>1000</td>
<td>0</td>
<td>1000 (shortage)</td>
</tr>
<tr>
<td>50</td>
<td>900</td>
<td>0</td>
<td>900 (shortage)</td>
</tr>
<tr>
<td>75</td>
<td>800</td>
<td>0</td>
<td>800 (shortage)</td>
</tr>
<tr>
<td>100</td>
<td>700</td>
<td>300</td>
<td>400 (shortage)</td>
</tr>
<tr>
<td>125</td>
<td>600</td>
<td>600</td>
<td>0 (equilibrium)</td>
</tr>
<tr>
<td>150</td>
<td>500</td>
<td>900</td>
<td>400 (surplus)</td>
</tr>
<tr>
<td>175</td>
<td>400</td>
<td>1200</td>
<td>800 (surplus)</td>
</tr>
<tr>
<td>200</td>
<td>300</td>
<td>1500</td>
<td>1200 (surplus)</td>
</tr>
</tbody>
</table>
Presenting this graphically

Price

Supply
Demand
Surplus
Shortage

Quantity

75 100 125 200

300 600 700 1500
The aim of tobacco control policy

• Shift the demand curve or the supply curve such that the equilibrium quantity decreases

• Some examples:
  – Ban tobacco advertising
  – Impose smoke-free policies
  – Impose/increase excise taxes
Another important concept

- **Nominal vs. real price**
  
  - **Nominal price:**
    - The price that you see in the shop/retail outlet
    - It changes (increases) from year to year
  
  - **Real price**
    - An “artificial” price that removes the impact of inflation (i.e. the fact that prices in general are increasing)
    - It is typically used to determine whether product X is becoming relatively cheaper or more expensive over time

- Can the nominal price increase and the real price decrease at the same time?
Summary

- Economics is useful in understanding why certain tobacco control interventions are effective in reducing tobacco consumption.
- Policy makers can reduce both the demand and supply of tobacco, reducing tobacco consumption.
Elasticity
What is elasticity?

Responsiveness

By how much does something change in response to a 1% change in something else
Price elasticity of demand

- **Definition:**
  - By how much does consumption of good X change in response to a 1% increase (or decrease) in the price of the good

- **Formula:**
  - Percentage change in $Q_d$/percentage change in $P$

- **Relatively elastic vs. relatively inelastic demand:**
  - $E_p$ between 0 and -1: relatively inelastic
  - $E_p$ greater than -1 (in absolute terms): relatively elastic
How does price elasticity work in practice? An example

At the outset:
- 1000 smokers, each smoking 100 cigarettes; total consumption is 100 000 cigarettes
- Price = R100
- Price elasticity of demand = -0.6

Assume that price increases by 10%

As a result consumption drops by 10 x 0.6 = 6%

New consumption = 94 000

Two questions:
- What happens to the number of smokers?
- Are remaining smokers going to reduce their smoking?
Understanding the decrease in consumption better

• International evidence:
  – About 50% of decrease in consumption is due to people quitting and the other 50% due to remaining smokers smoking less on average

• Thus in this example
  – Number of smokers decrease by 3% from 1000 to 970
  – Average cigarette consumption by remaining smokers decreases by 3% from 100 to 97 cigarettes
What is the magnitude of the price elasticity of demand for tobacco?

- Hundreds of studies have estimated the price elasticity of demand for tobacco
  - Initially only in high-income countries, especially the US
  - Since the early 1990s increasingly in LMICs
  - Different data sets and techniques

- The results are amazingly consistent
  - Price elasticity lies in inelastic range (between 0 and -1)
  - Most estimates lie between -0.4 and -0.8
  - Demand for tobacco is often more price inelastic in HICs than in LMICs
  - Lower income groups and young people are more price sensitive (elastic) than the general population
Summary

- Increasing the excise tax on cigarettes is a win-win situation:
  - Reduces consumption
  - Increases government revenues

- The evidence that the price elasticity of demand for cigarettes is in the inelastic range is so strong, that one can safely apply this knowledge to countries that do not have the data to allow one to estimate the price elasticity
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