TECHNICAL NOTE III

Tobacco taxes in WHO Member States

This report includes appendices containing information on the share of total and excise taxes in the price of the most widely sold brand of cigarettes, based on tax policy information collected from each country. This Technical Note contains information on the methodology used by WHO to estimate the share of total and tobacco excise taxes in the price of a pack of 20 cigarettes using country-reported data.

Data collection

Data were collected between July and December 2010 by WHO regional data collectors. The two primary inputs into calculating the share of total and excise taxes were prices and tax rates and structure.

Information collected included the prices of the most widely sold brand of cigarettes, the least-expensive brand and the Marlboro brand for July 2010. Detailed information was collected in each country on the taxation of cigarettes (and, for some countries in SEAR, bidis) and tobacco tax revenues. Documents such as laws, decrees or other official materials in support of the information provided were also collected.

Data on tax structure were collected through contacts with ministries of finance. The validity of this information was checked against other sources. These sources, including tax law documents, decrees, and official schedules of tax rates and structures and trade information, when available, were either downloaded from ministerial web sites or from other United Nations databases such as Comtrade (http://comtrade.un.org/db/). Other secondary data sources were also purchased for data validation.

The tax data collected focus on indirect taxes levied on tobacco products (e.g. excise taxes of various types, import duties, value added taxes), which usually have the most direct policy impact on the price of tobacco products. Excise taxes are the most important because they are applied exclusively to tobacco and contribute the most to substantially increasing the price of tobacco products and subsequently reducing consumption. Thus, rates, amounts, functioning and application of excise taxes are central components of the data collected.

Data were not collected on other taxes (e.g., income taxes, corporate taxes) because of the practical difficulty of obtaining information on these taxes and the complexity in estimating their potential impact on price.

The table below describes the types of tax information collected.

<table>
<thead>
<tr>
<th>Tax Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>1. Amount-specific excise taxes</td>
<td>An amount-specific excise tax is a tax on a selected good produced for sale within a country, or imported and sold in that country. In general, the tax is collected from the manufacturer/wholesaler or at the point of entry into the country by the importer, in addition to import duties. These taxes come in the form of an amount per pack, per 1000 sticks or per kilogram. Example: US$ 1.50 per pack of 20 cigarettes.</td>
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<tr>
<td>2. Ad valorem excise taxes</td>
<td>An ad valorem excise tax is a tax on a selected good produced for sale within a country, or imported and sold in that country. In general, the tax is collected from the manufacturer/wholesaler or at the point of entry into the country by the importer, in addition to import duties. These taxes come in the form of a percentage of the value of a transaction between two independent entities at some point of the production/distribution chain; ad valorem taxes are generally applied to the value of the transactions between the manufacturer and the retailer/wholesaler. Example: 27% of the retail price.</td>
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<tr>
<td>3. Tobacco-specific import duties</td>
<td>An import duty is a tax on a selected good imported into a country to be consumed in that country (i.e. the goods are not in transit to another country). In general, the import duties are collected from the importer at the point of entry into the country. These taxes can be either amount-specific or ad valorem. Amount-specific import duties are applied in the same fashion as amount-specific excise taxes. Ad valorem import duties are generally applied to the CIF (cost, insurance, freight) value, i.e. the value of the unloaded consignment that includes the cost of the product itself, insurance, transport and unloading. Example: 50% import duty levied on CIF.</td>
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<tr>
<td>4. Value added taxes</td>
<td>The value added tax (VAT) is a “multi-stage” tax on all consumer goods and services applied proportionally to the price the consumer pays for a product. Although manufacturers and wholesalers also participate in the administration and payment of the tax all along the manufacturing/distribution chain, they are all reimbursed through a tax credit system, so that the only person who pays in the end is the final consumer. Most countries that impose a VAT do so on a base that includes any excise tax and customs duty. Example: VAT representing 10% of the retail price.</td>
</tr>
<tr>
<td>5. Other taxes</td>
<td>Any other tax that is not called an excise tax, import duty, or VAT but applies to either the quantity of tobacco or to the value of a transaction of tobacco product was reported in the questionnaire, with as much detail as possible regarding what is taxed (base), who pays the tax and how the base is taxed.</td>
</tr>
</tbody>
</table>
on cigarettes based on either length of cigarette, quantity produced or type (e.g. filter vs non-filter), only the rate that applied to the most sold brand was used in the calculation. The only exceptions were made for Canada and the United States where average estimates had to be calculated for prices and taxes because, in addition to federal taxes, different rates were applied by states/provinces, and in some instances by localities.

The import duty was only applied to the most popular brand of cigarettes that were imported into the country. Import duty is not applied on total tax calculation for countries reporting that the most popular brand was produced locally.

“Other taxes” are all other indirect taxes excluding excise, import duties and VAT. These types of taxes were considered excises if they had a special rate applied on tobacco products. For example, Thailand reported the tax earmarked from tobacco and alcohol for the Thai Health Promotion Foundation as “other tax”. However, since this tax is applied only on tobacco and alcohol products, it acts like an excise tax and it was considered an excise in the calculations.

The next step of the exercise was to convert all tax rates into the same base, in our case, the tax-inclusive retail sales price (hereafter referred to as \( P \)). Consider the following example where Country B applies the same ad valorem tax as Country A, but ends up with higher taxation because the tax is applied later in the distribution chain:

Comparing reported ad valorem tax rates without taking into account the stage at which the tax is applied could therefore lead to biased results. This is why WHO used the information provided on tax policy in order to calculate the share of tobacco taxes on the most widely sold pack of cigarettes in the country. This indicator takes into account the exact contribution of all taxes in the price of a cigarette pack and therefore represents the best measure of the magnitude of tobacco taxes.

### Calculation

\( S_{va} \) is the share of taxes on the price of a widely consumed brand of cigarettes (20-cigarette pack or equivalent).

\[
S_{va} = S_{as} + S_{av} + S_{id} + S_{vat} \tag{1}
\]

Where:

- \( S_{as} \) = Total share of taxes on the price of a pack of cigarettes;
- \( S_{av} \) = Share of amount-specific excise taxes (or equivalent) on the price of a pack of cigarettes;
- \( S_{id} \) = Share of import duties on the price of a pack of cigarettes (if the most popular brand is imported);
- \( S_{vat} \) = Share of the value added tax on the price of a pack of cigarettes.

Calculating \( S_{va} \) is fairly straightforward and involves dividing the amount for a 20-cigarette pack by the total price. Unlike \( S_{as} \), \( S_{av} \) (the share of ad valorem taxes), is much more difficult to calculate and involves making some assumptions. On the other hand, \( S_{va} \) is sometimes amount-specific and sometimes value-based. It is therefore calculated the same way as \( S_{as} \) if it is amount-specific and the same way as \( S_{va} \), if it is value-based. \( S_{vat} \) is usually applied at the end of the taxation process, either on the VAT-exclusive or inclusive retail sales price.

To calculate price, it was assumed that the price of a pack of cigarettes could be expressed as the following:

\[
P = [(M + M \times ID) + (M + M \times ID \times T_{va}%) + T_{va} + \pi] \times (1 + VAT\%)
\]

Where:

- \( P \) = Price per pack of 20 cigarettes of the most popular brand consumed locally;
- \( M \) = Manufacturer’s/distributor’s price, or import price if the brand is imported;
- \( ID \) = Total import duties (where applicable) on a pack of 20 cigarettes;
- \( T_{va} \) = Statutory rate of ad valorem tax;
- \( T_{as} \) = Amount specific excise tax on a pack of 20 cigarettes;
- \( \pi \) = Retailer’s, wholesaler’s and importer’s profit margins (sometimes expressed as a mark-up);
- \( VAT \) = Statutory rate of value added tax.

Changes to this formula were considered based on country-specific conditions such as the existence of ad valorem and specific excise taxes and the tax base, and whether the most popular brand was locally produced or imported. In most cases the base for the ad valorem excise tax was the manufacturer’s/distributor’s price.

Given knowledge of price \( P \) and amount-specific excise tax \( T_{as} \), the shares \( S_{as} \) (and, where applicable, \( S_{id} \)) are easy to recover. The case of ad valorem taxes (and, where applicable, \( S_{va} \)) is more complicated because one needs to recover and separate the base \( (M + M \times ID) \) of the tax into its component parts in order to calculate the amount

### Table: Tax Inclusive Retail Sales Price of Cigarettes

<table>
<thead>
<tr>
<th>Country</th>
<th>Price (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2.00</td>
</tr>
<tr>
<td>B</td>
<td>2.00</td>
</tr>
</tbody>
</table>

- **[A]** Manufacturer’s price (same in both countries)
- **[B]** Country A: ad valorem tax on manufacturer’s price (20%) = 20% x [A] = **0.40**
- **[C]** Countries A and B: specific excise = 2.00
- **[D]** Retailer’s and wholesaler’s profit margin (same in both countries) = 0.20
- **[E]** Country B: ad valorem tax on retailer’s price (20%) = 20% x [A] + [C] + [D] = **0.84**
- **[F]** Final price = \( P = [A] + [B] + [C] + [D] + [E] \) = 4.60

**Country B**: ad valorem tax on retailer’s price (20%) = 20% x [A] + [C] + [D] - [E] = **5.04**
of ad valorem tax. In most of the cases $M$ was not known (unless specifically reported by the country).

Using equation 3, it is possible to calculate $M$:

$$M = \frac{P}{1 + VAT\%}$$

Unfortunately, $\pi$ is unknown and will systematically vary from country to country. For domestically produced most popular brands, we considered $\pi$ to be nil (i.e. 0) in the calculation of $M$ because the retailer’s and wholesaler’s margins are assumed to be small. This would result in an overestimation of $M$ and therefore of the base for the ad valorem tax. This will in turn result in an overestimation of the amount of ad valorem tax. Since the goal of this exercise is to measure the share of tobacco taxes in the price of a typical pack of cigarettes, the assumption that the retailer’s/wholesaler’s profit ($\pi$) is nil, therefore, does not penalize countries by underestimating their ad valorem taxes. In light of this, it was decided that unless and until country-specific information was made available to WHO, the retailer’s/wholesaler’s margin would be assumed to be nil for the domestically produced brands.

However, for those countries where the most popular brand is imported, assuming $\pi$ to be nil would grossly overestimate the base for the ad valorem tax because the importer’s profit needs to be taken into account. The import duty is applied on CIF values, and the consequent excise taxes are applied on import duty inclusive CIF values. The importer’s profit or own price is added on tax-inclusive CIF value. For domestically produced cigarettes, the producer’s price includes its own profit so it is automatically included in $M$, but this is not the case for imported products where the tax is imposed on the import duty-inclusive CIF value excluding the importer’s profit. So calculating $M$ as in equation 3 should mean assuming the importer’s profit to be zero. The importer’s profit is assumed to be relatively significant and ignoring it would therefore overestimate $M$. For this reason, $M$ had to be estimated differently for imported products: $M^*$ (or the CIF value) was calculated using secondary sources (e.g. data from the United Nations Comtrade database). $M^*$ was normally calculated as the import price of cigarettes in a country (value of imports divided by the quantity of imports for the importing country). However, because of limited data availability and because of inconsistencies in the import data in some cases, the export price was also considered. When both values were available, the higher of the two was selected for the CIF value. Looking more closely at the data, import and export prices sometimes varied greatly depending on the partner considered. In order to take this variation into account, the average import and export prices were weighted for each country by the quantities of the imports/exports coming from the different available partners. When the export price was selected, an additional 10 cents was added to the CIF value because the export price does not include cost, insurance and freight price. The 10 cents value was calculated based on the global difference between import and export prices. The ad valorem and other taxes were then calculated in the same manner as for local cigarettes using $M^*$ as the base, where applicable.

In the case of VAT, in most of the cases the base was $P$ excluding the VAT (or, similarly, the manufacturer’s/distributor’s price plus all taxes other than VAT). In other words:

$$S_{vat} = VAT\% \times (P - S_{vat})$$

So in sum the tax rates are calculated this way:

$$S_{ts} = S_{id} + S_{as} + S_{av} + S_{vat}$$

$$S_{as} = T_{as} + P$$

$$S_{av} = (T_{av} \% \times M) + P$$

or

$$S_{av} = (T_{av} \% \times M^* \times (1 + S_{vat})) + P$$

if the most popular brand was imported

$$S_{id} = (T_{id} \% \times M^*) + P$$

(if the import duty is value-based)

or

$$ID + P$$

(if it is specific)

$$S_{vat} = VAT\% \times (1 + VAT\%)$$

### Prices

In order to reduce chances of inconsistency in prices collected in 2008 compared to those reported in 2010, the questionnaire distributed among data collectors in 2010 included the brands and prices reported in 2008.3

In the case of the most sold brand used for the tax calculation, the information reported in 2010 can be gathered in four groups:

a) brand reported has changed and the price is the same/higher than in 2008;

b) brand reported has changed and the price is lower;

c) brand reported is the same and price is the same/higher;

d) brand reported is the same but price is lower.

The following action was taken for each group:

Groups a and c: no action was taken.

Group a: one concern that could be raised is the comparability of the data when different brands are reported between two years. However, for countries where secondary data were available, the new brand reported often had the same market share as the brand reported in 2008 and they were both in the same price category (22 countries in this group: Albania, Azerbaijan, Bangladesh, Burkina Faso, Cameroon, the Dominican Republic, El Salvador, the Gambia, Ghana, Grenada, Guinea, Honduras, Jordan, Mauritius, Myanmar, Nicaragua, Palau, Panama, the Russian Federation, Saint Kitts and Nevis, Turkey and Zambia).

Groups a and c: another question could be raised here when no tax change was perceived but a higher price was reported in 2010 compared to
2008. It was assumed, however, that the industry tends to increase the price of its product because of inflation, income growth, increase in cost or just to increase its profit margin whenever it has the opportunity to do so.

Groups b and d: an important assumption made was that prices could not have gone down from 2008 to 2010 unless there was a tax decrease (e.g. Myanmar). Because of positive inflation and increase in incomes the price cannot go down. Therefore, the prices had to be revised:

- In group b: the brand and price for 2008 were replaced by the data reported in 2010, resulting in no change between the two years. The 2010 price was chosen as a reference because in many regions the data collection process was improved, involving data collectors more knowledgeable in tobacco tax and price issues (12 countries in this group: Antigua and Barbuda, the Bahamas, the Comoros, Cook Islands, Ecuador, Iran (Islamic Republic of), the Philippines, Saint Lucia, Sierra Leone, Swaziland, Tonga and Tuvalu).

- In group d: it seemed odd to experience a reduction in the price of a same brand between 2008 and 2010 while no tax changes or other major events occurred. It was therefore assumed that a mistake was made in the reporting, so the price for 2008 was also replaced by the price reported in 2010, resulting in no change in the price between the two years (four countries in this group: Afghanistan, Dominica, Maldives and Micronesia (Federated States of)).

Similarly, a tax share might increase despite no change or a decrease in the tax.

In the current database, there are cases of tax increases between 2008 and 2010 where the share of tax as a percentage of price either did not change or went down. This is mainly due to the fact that, in absolute terms, the increase in the price is larger than the increase in the tax (particularly in the case of specific excise tax increases).

For example, in Uzbekistan, the excise tax increased from 104.1 sums per pack in 2008 to 143.2 sums per pack in 2010 (a non-negligible increase) while the price of the most sold brand increased from 700 to 1100 sums per pack. In terms of tax share, however, the excise represented 14.87% (104.1/700) of the price in 2008 while it represented 13.02% (143.2/1100) of the price in 2010. This is because the prices increased to a larger extent than taxes did.

Conversely, there are also cases where increases (decreases) in the tax as a share of the price occurred despite no change in the tax. In the current database, this was due to one of the following reasons:

- Price increased independently of tax change (leading to a decrease in the tax share).

- In the case of imported products, the CIF value had to be estimated using secondary data, as explained above. The CIF values are provided in US$, so they were converted into the local currency. This exercise introduced other external factors that had also an impact on the results for taxes as a percentage of the retail price (one of the following reasons or a combination of the two):
  - CIF value in US$ decreased (increased) between 2008 and 2010, making the base for the application of the tax lower (higher), therefore leading to a lower (higher) tax percentage despite no change in the tax rate.
  - The exchange rate decreased (increased) between 2008 and 2010, leading to a lower (higher) CIF value in the local currency, leading also to a lower (higher) base for the application of the tax and also leading to a lower (higher) tax percentage.

1 This formula applies when the ad valorem tax is applied on the manufacturer’s/distributor’s price, the import duty is applied on the manufacturer’s/distributor’s price or the CIF value, and the VAT is applied on the VAT-exclusive retail price. Other scenarios exist (e.g. Ad valorem rate applies to the retail price) but they are not described here because they are usually more straightforward to calculate.

2 Import duties may vary depending on the country of origin in cases of preferential trade agreements. WHO tried to determine the origin of the pack and relevance of using such rates where possible.

3 The brands are used for internal purposes for data validation and are not published in this report.