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Tobacco Tax Policy

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Tobacco Tax and Economics

- **Public health** – will higher taxes improve health of the nation?
- **Budget** – will higher taxes increase or decrease budget income?
- **Economy/development** – is there any negative effect? Employment? Smuggling?
- **Equality** – will higher taxes burden low income groups? How about individual welfare?
- **Retaliation from the tobacco industry to new taxes**

Taxation is the Most Effective Measure

- Higher taxes induce quitting, reduce consumption and prevent starting
- A 10% price increase reduces demand by:
 - 4% in high-income countries
 - 8% in low or middle-income countries
 - About half of the effect is on amount and half on initiation
 - Long-run effects may be greater
- Young people and the poor are the most price responsive

Criteria for evaluating taxes

- **Efficiency** (neutrality for market incentives)
- **Equity** (fairness)
- **Simplicity**
 - Minimising public administrative costs
 - Minimising private compliance costs
- **Vulnerability to tax avoidance** (legal exploitation of tax loopholes)
- **Vulnerability to tax evasion** (reducing tax by illegal means)

Efficiency

- Generating revenue with the minimum amount of distortion of resource allocation (unless deliberate) - Tobacco taxes aim to deliberate **distort incentives** (to reduce smoking)
- Desirable to have **a broad-based, uniform rate** system so that the tax cannot be avoided by switching to another brand or type of tobacco
- For example, **import duty** could be avoided by switching to domestically-produced tobacco; different taxes on cigarette and **RYO tobacco**

Equity (fairness)

- Alleviating (or not increasing) **poverty**
- There are more effective ways than tobacco taxes to achieve fairness
 - Broad-based (non discriminatory) consumption taxes
 - Income taxes
- But the best way to help the poor is to provide **public social welfare** and pay for health expenditures
- Could be funded from tobacco tax revenue (**earmarked tax**)

Simplicity

Goal is to achieve:

- **Low compliance costs** – minimising costs imposed on business in collecting the tax and remitting it to the tax authorities
- **Low administrative costs** – minimising the costs imposed on the public sector in administering and collecting the tax

Vulnerability to tax avoidance and tax evasion

- Some types of taxes are much more vulnerable:
- Narrow-based taxes (taxes with multiple exemptions) as opposed to **broad-based taxes**
- Taxes with multiple rates as opposed to **single rate taxes**
- Retail taxes as opposed to **wholesale taxes** (many more taxing points are difficult to oversee and result in many more cash transactions)

The Numbers Principle of Economic Policy (1)

- For efficient economic policymaking the **number of economic instruments** must be at least equal to the number of targets
- **Targets** are the objectives of economic policy (for example, reducing smoking, reducing poverty)
- **Instruments** are policies designed to achieve targets (for example, taxation)
- Thus tobacco taxation cannot be used both to reduce smoking and, **at the same time**, to reduce poverty in the short run

The Numbers Principle of Economic Policy (2)

- **In the short run** tobacco taxation may increase **poverty** while reducing smoking
- But low tobacco taxes will not protect the poor
- The **health effects** of smoking hit the poor comparatively hard, because their health status is lower and they have less money to pay for health care
- **In the long run** the poor benefit greatly from smoking less
- Quitting smoking also **releases funds** for other expenditure e.g. education, health
- Thus tobacco taxation should be used to reduce smoking, and **other economic measures** should be used to correct for any undesirable equity effects

Categories of Taxes

Ad valorem taxes

- Applied as a percentage of some value (for example, wholesale price)
- Automatically indexed (as cigarette prices rise, tax revenue automatically rises)

Specific taxes

- Tax base is a physical measure (for example, per kilo of tobacco or per stick)
- Not automatically indexed

Types of Taxes (1)

Value-added tax (VAT)

- Efficient (especially if broad-based, single rate)
- High administrative and compliance costs (especially if exemptions and multiple rates)
- Values are harder to measure than physical quantities
- Many taxing points
- Vulnerable to evasion at retail level through the cash economy. Relatively invulnerable at other levels
- Automatically indexed
- High rates politically difficult
- For these reasons, difficult to use to discriminate against smoking

Types of Taxes (2)

Retail sales tax

- Automatically indexed
- Relatively high administrative and compliance costs
 - Many taxing points
- Highly vulnerable to evasion
 - Most transactions in cash
 - Many taxing points

Wholesale sales tax

- Automatically indexed
- Lower administrative and compliance costs
 - Fewer taxing points
- Less vulnerable to evasion
 - Fewer cash transactions
 - Fewer taxing points

Types of Taxes (3)

Excise duty (specific tax)

- **Relatively low administrative and compliance costs**
 - Fewer taxing points
- **Less vulnerable to evasion**
 - Fewer taxing points
 - Fewer cash transactions
- **Physical quantities are easier to measure than values**
- **Not automatically indexed and difficult to legislate for new rate each year**
- **But automatic indexation is possible, for example by legislating automatic link between rates and price indexes**
- **Per stick taxes may encourage the production of longer cigarettes (e.g. “super king sized”)**

Types of Taxes (4)

Import duties (customs duties, tariffs)

- **Low administrative and compliance costs**
 - Relatively few taxing points
- **Inefficient**
 - Distorts resource allocation towards protected domestic industry
 - Better to have an efficient tobacco industry which can be heavily taxed, yielding high revenue to fund other expenditures
- **Vulnerable to avoidance (by switching to domestically produced cigarettes)**
- **Vulnerable to evasion (through smuggling)**

Should Tobacco Taxes be Earmarked?

- Setting aside part of tobacco tax revenue to particular uses, for example:
 - Health promotion foundations
 - Health care expenditure
- But needs to be **designed carefully** otherwise it may just release resources to be used elsewhere
- Can be a useful **political device** to sell high tobacco taxation to the electorate

Tax Design - Conclusions

- Different circumstances exist in different countries and one size does not fit all

Recommendations

- **Broad-based, uniform rate**
 - For example, maintain consistency of rate between cigarettes and roll-your-own tobacco
- **Relatively few collection points**
- **No discrimination against imports**
- **VAT is not easy to use to discriminate against tobacco**
- **Specific excise tax (with automatic indexation) or wholesale sales tax have most advantages**

Example Cambodia (1)

- Different tax structure for local and imported cigarettes

Local cigarettes:

10% excise tax (ex-factory price) +
10% VAT (ex-factory price with excise
tax) + 3 % public tax (ex-factory
price with excise tax and VAT)

This is **24.6%** of factory price, but
19.8% of retail price

Example Cambodia (2)

Imported cigarettes:

7%, 15%, 35% import duty on CIF value

(CIF = costs + insurance + freight) +

10% excise tax (CIF with import duty) +

10% VAT (CIF with import duty and

excise tax) + 3 % public tax (CIF with

import duty and excise tax and VAT)

This is 33%, 43%, 68% of CIF, but

25%, 30%, 41% of retail price

Cigarette Taxes in the EU

Type of tax:

- **specific excise** (a given amount in euro per 1000 cigarettes) - higher efficiency for securing budget revenue, reduces price differentials, drives cheap brands out of the market ; favored by **manufacturing states**
- **ad valorem excise** (% of retail price) -protects cultivation of inferior tobacco; favored by **tobacco producing states**
- **VAT** (% of retail price), mostly levied on other goods as well

EU Cigarette Taxes Regulations

(1)

Option 1

57% - minimum level of excise (specific and ad valorem) duty in retail price (most popular price category) and **€ 60 per 1000** cigarettes is the minimum total excise (€ 64 as of 1 July 2006)

Option 2

€ 95 per 1000 cigarettes (€ 101 as of 1 July 2006) and no 57% rule

EU Cigarette Taxes Regulations

(2)

5% - 55% - specific excise in the total tax including VAT

The balance between ad valorem and specific taxation is not regulated

Tobacco growing states favor ad valorem

Tobacco manufacturing states favor specific tax

Goal: price harmonization

Tax Levels in EU 2003

Country	Specific excise	Ad Valorem excise	Total excise	VAT	Total Tax	Price in € most popular cigarettes
Specific rates						
Ireland	43.59%	18.32%	61.91%	17.36%	79.27%	6.12
United Kingdom	42.96%	22.00%	64.96%	14.89%	79.86%	7.18
Portugal	38.75%	23.00%	61.75%	15.97%	77.72%	2.1
Germany	36.63%	24.23%	60.87%	13.79%	74.65%	3.37
Netherlands	36.49%	20.51%	57.00%	15.97%	72.97%	3.04
Denmark	32.61%	21.22%	53.83%	20.00%	73.83%	4.03
Ad valorem rates						
Austria	14.25%	42.00%	56.25%	16.67%	72.92%	3
Belgium	11.16%	45.84%	57.00%	17.36%	74.35%	3.36
Sweden	10.67%	39.20%	49.87%	20.00%	69.87%	4.11
Luxembourg	10.25%	46.84%	57.09%	10.71%	67.81%	2.32
Finland	7.56%	50.00%	57.56%	18.03%	75.60%	4
Spain	4.01%	54.00%	58.01%	13.79%	71.80%	1.95
Italy	3.73%	54.26%	58.00%	16.67%	74.67%	2.07
Greece	3.64%	53.86%	57.50%	15.25%	72.75%	2.5
France	3.35%	58.05%	61.40%	16.39%	77.79%	5

Tax Levels in Accession Countries 2003

Country	Specific excise	Ad Valorem excise	Total excise	VAT	Total Tax	Price in € most popular cigarettes
Cyprus	60.95%	0%	60.95%	13.04%	74.01%	2.22
Czech Rep	18.00%	22.00%	40.00%	18.03%	58.03%	1.32
Estonia	25.45%	24.00%	49.45%	15.25%	64.70%	1.05
Hungary	28.70%	23.00%	51.70%	20.00%	71.70%	1.58
Latvia	37.42%	0%	37.42%	15.25%	52.67%	0.52
Lithuania	32.15%	10.00%	42.15%	15.25%	57.41%	0.77
Malta	6.16%	53.10%	59.26%	13.04%	72.30%	3.03
Poland	31.67%	25.00%	56.67%	18.03%	74.70%	0.88
Slovakia	42.22%	0%	42.22%	16.70%	58.89%	1.08
Slovenia	13.94%	39.07%	53.00%	16.67%	69.67%	1.49

Aggregate Data Analysis

- **Questions it can answer**
 - overall impact of average retail price on total demand
 - overall impact of disposable income on total demand
 - overall impact of public policies, health knowledge, etc. on total demand

Aggregate Data Analysis

- **Weaknesses**

- **simultaneity problem (perfectly elasticity of supply must be assumed)**
- **cross-border shopping is masked (overestimating of price elasticity)**
- **smokers' characteristics and preferences (e.g. for low tar/nicotine products) are hidden**
- **change in # of smokers from change in # of cigarettes smoked by smokers cannot be distinguished**
- **causal link between tobacco control policies and consumption may be disguised** (decline in smoking can make it easier to pass anti-smoking laws)

Individual Level Data Analysis

- **Strengths over Aggregate Analysis**
 1. **Simultaneity bias is less likely (an individual cannot affect market price)**
 2. **Individual characteristics are less correlated with price and policy measures**
 3. **Can evaluate the impact on both smoking rate and # cigarettes to consumed**
 4. **Different population subgroups (age, gender, education, etc) can be evaluated**

Individual Level Data Analysis

- **Weaknesses**

1. **Cross-border shopping is masked**
 - may lead to underestimating of price elasticity
2. **Ecological bias - omitted variables correlated with those included in a model (e.g. anti-smoking sentiment correlated with stricter tob. policies)**
3. **Self-reporting bias – assumption: the bias is proportional to true consumption, results not affected**
4. **Not possible to use one cross-section in the absence of real cross-section price differences**

Interpreting Results

Price elasticity

- describe sensitivity to price changes

(% change in demand resulting from 1% change in price; not units)

$$\% \Delta Q / \% \Delta P = d(Q) / d(P) * \text{mean } P / \text{mean } Q$$

- can be different for different SES groups
- can change over time (careful with time series data)
- used to predict changes in smoking prevalence and in tax collection

Example How to Use Price Elasticity Results

- **Population: price elasticity = - 0.4;**
tax increase causes cigarette prices to double (e.g from \$ 4 to \$ 8; if tax was 50%, tax increased by ?%)
 - There is 100% increase in price
 - Formula for Price Elasticity
Price Elasticity = % quantity / % price
-0.4 = % quantity / 100
% quantity = - 0.4 * 100 = - 40%
- **Result: doubling the price leads to 40% decline in consumption; if prevalence was 30%, the new prevalence is ?%**

Policy Implications

Impact of a tax increase on tax revenue

Current tax revenue = tax base(# cigarette packs) [10 mil] * tax rate(tax per pack) [2] = **20 mil**

Percentage increase in price = proposed tax increase/current price*100 = **100%**

Change in demand after tax increase = current demand(tax base) [10 mil] * price elasticity [-0.4] * percentage increase in price/100 [1] = - 4 mil

New tax revenue = new demand [6 mil] * new tax rate [6] = **36 mil**

Tax Incidence Issues

Regressivity:

A tax that is disproportionately falls on the poor and raise income inequality

Progressivity:

A tax takes a larger proportion of the income of the rich than it does of the poor and reduces inequality

Do the poor really pay more taxes when tobacco tax is increased?

It depends on:

- **Relative price elasticity**
- **Price paid**
- **Amount of smoking**

Additional Tax Burden (incremental change)

$$\begin{aligned}\Delta R &= Q\Delta t + t\Delta Q \\ &= Q\Delta t[1 + E\{t/P\}]\end{aligned}$$

ΔR = Changing in tax paid

Q = current quantity; ΔQ = Change in quantity after Δt

P = current price (including tax)

t = current tax per unit

Δt = proposed change in tax

E = Price elasticity

Examples (incremental change): Compare the Poor and the Rich

$$P = \$1.00 \quad t = \$0.50 \quad (\Delta t = \$0.10)$$

and

$$Q_P = 100 \quad Q_R = 100$$

$$E_P = -0.8 \quad E_R = -0.40$$

$$\Delta R_P = \$6.00 \quad \Delta R_R = \$8.00$$

The rich pays more by 33%, \$2.00

What if $Q_P=60$ $Q_R=100$?

What if $P_P=\$.80$ $P_R=\$1.00$?

Additional Tax Burden (unit change)

$$\begin{aligned}\Delta R &= Q\Delta t - t\Delta Q - \Delta t\Delta Q \\ &= Q\Delta t [1 + E\{(t + \Delta t)/P\}]\end{aligned}$$

ΔR = Changing in tax paid

Q = current quantity; ΔQ = Change in quantity after Δt

P = current price (including tax)

t = current tax per unit

$\Delta t = \Delta P$ = proposed change in tax

E = Price elasticity

Examples (unit change): Compare the Poor and the Rich

$$P = \$1.00 \quad t = \$0.50 \quad \Delta t = \$0.10$$

and

$$Q_P = 100 \quad Q_R = 100$$

$$E_P = -0.8 \quad E_R = -0.40$$

$$\Delta R_P = \$5.2 \quad \Delta R_R = \$7.6$$

The rich pays more by 46%, \$2.4

What if $Q_P=60$ $Q_R=100$?

What if $P_P=\$.80$ $P_R=\$1.00$?

Impact of Higher Taxes on Household Expenditure

$$\Delta B = a * (1 + E) \Delta T$$

ΔB = additional fraction of income spent on non-tobacco products

a = fraction of income spent on tobacco now

E = Price elasticity (negative)

ΔT = fraction change in the original tobacco price ($\Delta t/P$)

Example

$a = 0.024$ (spend 2.4% income on tobacco)

$E = -0.8$

$\Delta t = \$0.3 \Rightarrow \Delta T = \$0.3/\$3.0 = 0.1,$

$\Delta B = 0.024(1-0.8) \times 0.1 = 0.00048 = 0.048\%$

(non-tobacco expenditure will fall by 0.048% if $\Delta t = \$0.30$)

What if $a = 0.050$

if $E = -0.4$

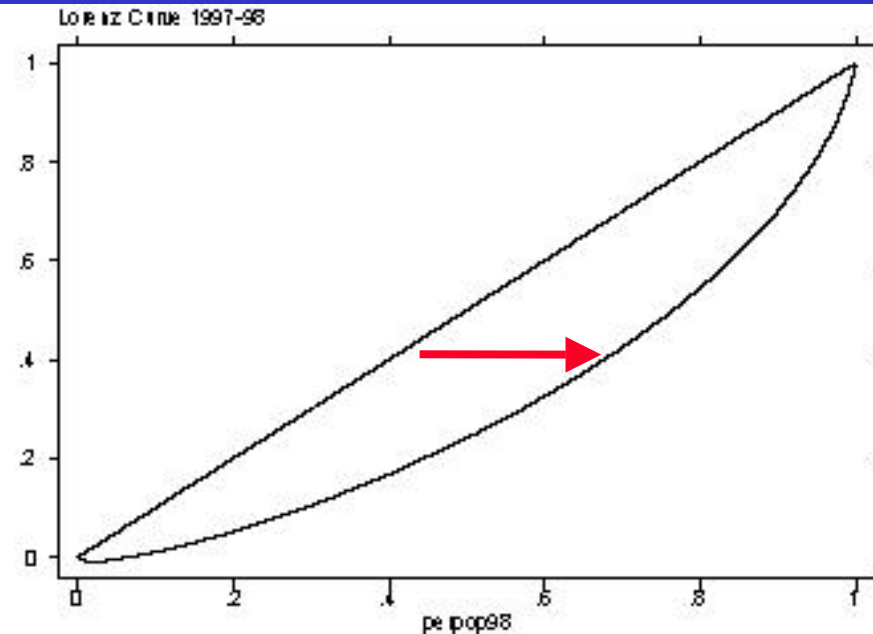
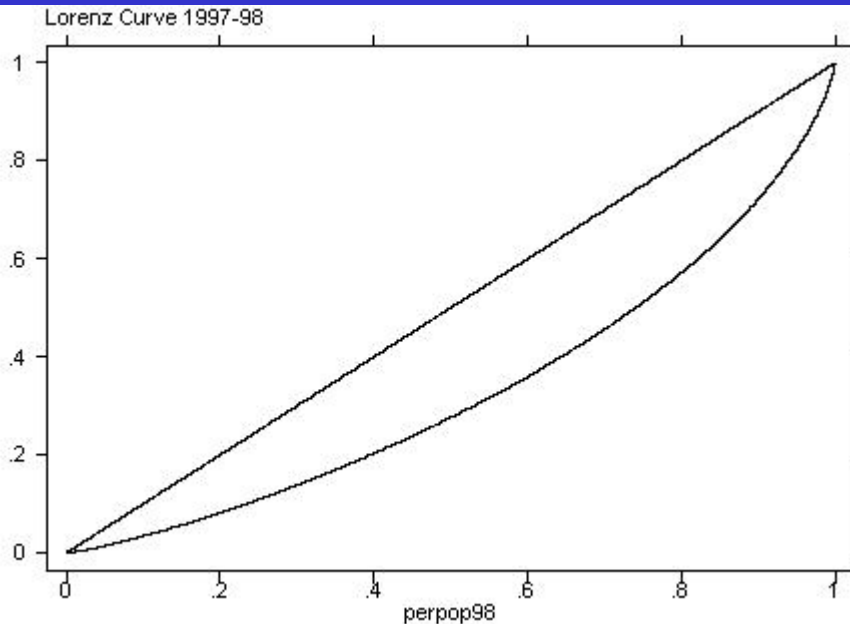
Impact on the Poor

- **Tax increases can be progressive**
 - **Greatest sensitivity to price in lowest income populations**
- **Tobacco taxes should be considered in context of overall tax and spending system**
 - **Revenues generated from tax can be used to support programs targeting the poor**
- **Health benefits of tobacco control are progressive**
 - **Tobacco accounts for about half of health gap between the rich and poor**

Equality - Lorenz Curve

Including tobacco

Excluding tobacco



Source: Hoang Van Kinh et al. *calculation from VLSS 1997-98*

Note: Inequality increases when removing taking tobacco spending from household spending

Hypothetical tax increase

Indonesian Example

Tax increase	% price change	% demand change	% tob. tax revenue change	Revenue change as % of GDP
10% ↑	3% ↑	1.5% ↓	8% ↑	0.26
50% ↑	18% ↑	9% ↓	36% ↑	0.33
100% ↑	36% ↑	18% ↓	63% ↑	0.40

What is the “right” level of tax?

- **Complex question**

Depends on various factors, such as degree to which society wishes to **protect children**, **revenue** considerations, health care costs, state of public health & **development**, etc.

- **Useful yardstick:** where comprehensive programs used, tax is at least $2/3$ to $4/5$ of retail price.

Source: Chaloupka *et al.*, 2000

Summary

- **Revenue loss?** likely to have revenue gains
 - a 10% tax increase would raise revenue by 7%
- **Job loss?** temporary, minimal, and gradual
- **Possible smuggling?** crack down on criminal activity, not lower taxes
- **Costs to individuals, especially the poor?** partially offset by lower consumption