Macroeconomic Impact of Tobacco Taxation in Serbia

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tobaccotaxation
Economic Research Informing
Tobacco Taxation Policy

Research objective

- This study aims to estimate the changes in output, income and employment in Serbian economy resulting from changes in tobacco use, and quantify the impact of such changes on other economic sectors.
- Goals:

1. Assess interlinkages between of tobacco products industry with other sectors;
2. Estimate output, income and employment multipliers;
3. Estimate changes in output, income and employment under several scenarios of change in tobacco products demand

Literature overview

- The two most widely used approaches in estimating the macroeconomic effects of tobacco taxation are input-output analysis (I-O) analysis and Computable General Equilibrium (CGE) modeling.

- Findings from the **IO studies**: increase in tobacco taxation is benefitial – stimulates consumption of other goods and increase tax revenues without fall in output;
- Findings from the **CGE studies**: increase in tobacco taxation is benefitial for output and employment if gov. revenues are reallocated into spending.

Data

- I-O tables compiled by the Statistical Office of the Republic of Serbia (SORS), decomposed into 88 divisions (2-digit NACE code)
- Annual structural business survey and statistics on wages.
- Employment statistics.

Methodology – first block

Development of the I-O model that captures linkages between tobacco industry and other sectors using multipliers

1. Initial effect: impact of changes in final demand of tobacco products on the output, income and employment in tobacco products manufacturing;

+

2. Direct effect: impact of changes in the final demand of tobacco products on the output, income and employment of input suppliers to tobacco products manufacturing;

+

3. Indirect effect: impact of changes in final demand of tobacco products on the output, income and employment of the industries that supply inputs to the industries that supply inputs to tobacco products manufacturing;

=

Simple multiplier

+

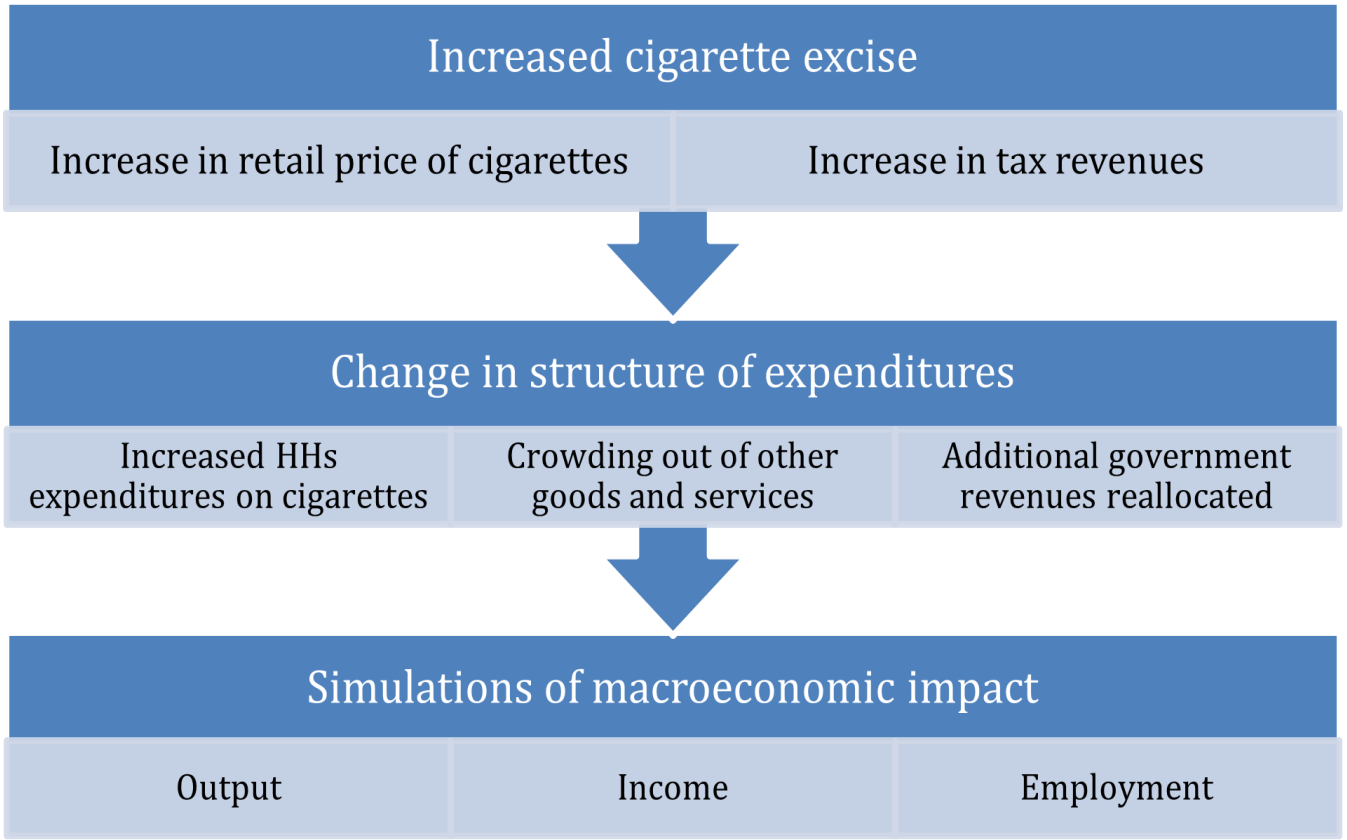
4. Consumption induced effect: impact of changes in final demand of tobacco products on the output of tobacco products manufacturing due to changes in consumption and wages.

=

Total multiplier

Methodology – second block

Scenario analysis and macroeconomic simulations of an increase in tobacco taxation



Methodology – pricing issues

Valuation in I-O tables
is given at basic prices
(unit cost of production)

Taxation does not affect
basic prices,
only purchaser' (retail) prices

Basic price. It measures the revenue per unit of products sold that remains in the hands of the producer (unit cost of production).

+ Taxes on production (non deductible)
- Subsidies in production

=

Producer's price. It is the price, excluding VAT, that the producer invoices to the trader

+ Transport charges separately invoiced
+ Wholesalers' and retailers' margins

=

Net-of-tax price. It is the price that the trader invoices to the consumer (net of taxes on consumption).

+ Taxes on consumption (VAT, sales, excises)

=

Purchaser's price. It is the price the consumer pays for the products (typically retail price).

Methodology – scenarios

WARP 2019	Baseline	25% specific tax increase	43.6% specific tax increase
Price	274.24	309.38	335.53
Specific excise	70.75	88.44	101.60
Ad valorem excise (33%)	90.5	102.10	110.72
VAT (20%)	45.71	51.56	55.92
NOT price	67.28	67.28	67.28
tax burden	75.47%	78.25%	79.95%
excise burden	58.80%	61.59%	63.28%
Price Increase		12.81%	22.35%

Methodology – simulations

Simulations	Assumption on amount of additional revenues reallocation	Assumption on structure of additional revenues reallocation	Simulations	Assumption on amount of additional revenues reallocation	Assumption on structure of additional revenues reallocation
Simulation A	100%	• 50% into the agriculture & food production • 25% into the education & science • 25% into the health & social work	**Simulation D**	80%	• 50% into the agriculture & food production • 25% into the education & science • 25% into the health & social work
Simulation B	100%	• 25% into the agriculture & food production • 50% into the education & science • 25% into the health & social work	**Simulation E**	80%	• 25% into the agriculture & food production • 50% into the education & science • 25% into the health & social work
Simulation C	100%	• 25% into the agriculture & food production • 25% into the education & science • 50% into the health & social work	**Simulation F**	80%	• 25% into the agriculture & food production • 25% into the education & science • 50% into the health & social work

Results - Multipliers

Multiplier type	Output	Income of employees	Employment (per bil. RSD)
1. Initial effect	1.00	0.032	17
2. Direct effect	0.59	0.074	73
3. Indirect effect	0.59	0.087	85
Simple multiplier	2.18	0.193	175
4. Consumption induced effect	0.68	0.076	67
Total multiplier	2.86	0.269	243

Results - Multipliers

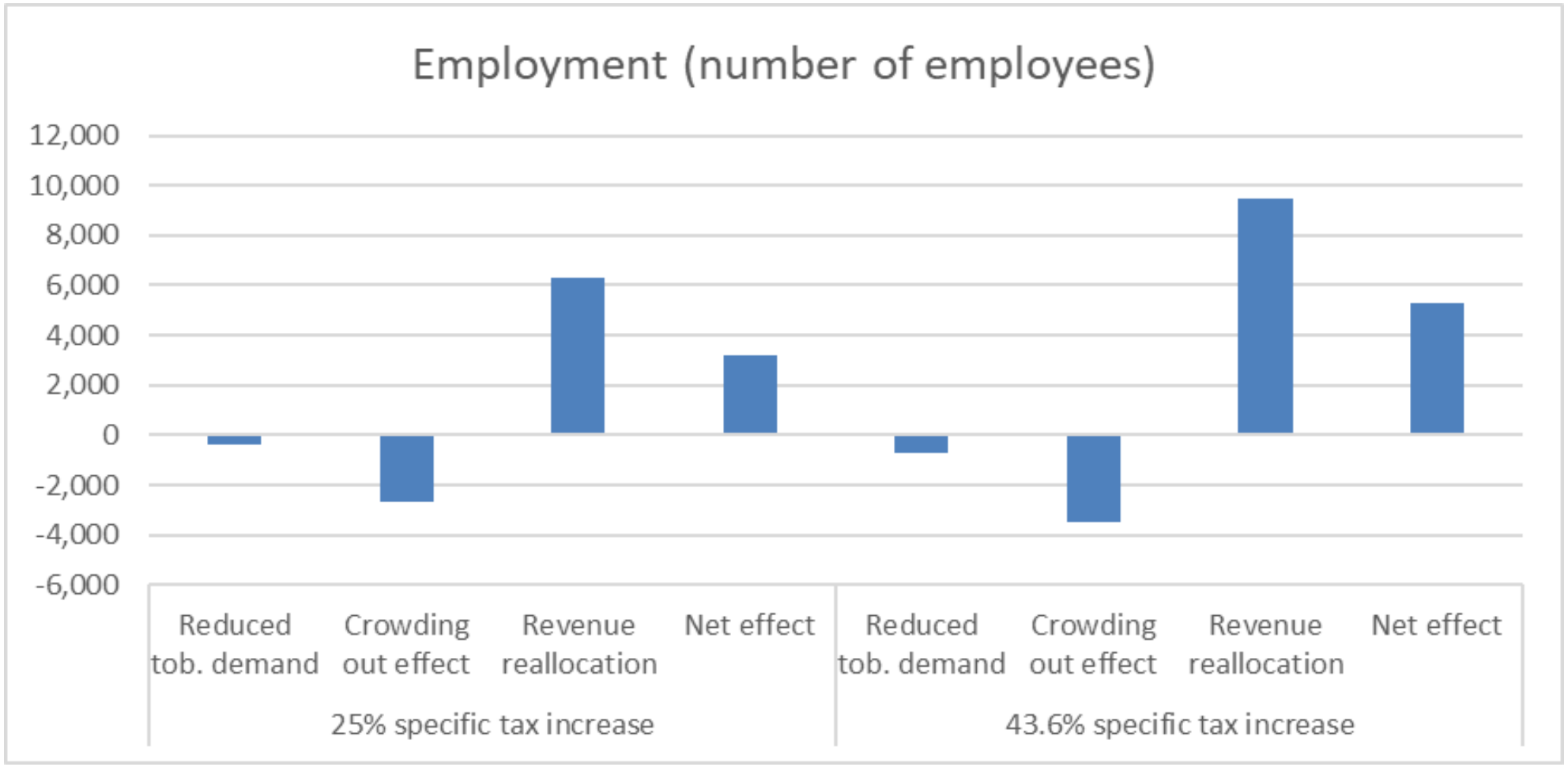
Top 5 industries (apart from tobacco products manufacturing) affected by changes in the final demand of tobacco products, based on total- multipliers

Output		**Income**		**Employment**	
Industry	Share	Industry	Share	Industry	Share
Wholesale trade, except of motor vehicles and motorcycles	6.58%	Wholesale trade, except of motor vehicles and motorcycles	12.95%	Crop and animal production, hunting and related service activities	24.06%
Crop and animal production, hunting and related service activities	5.11%	Crop and animal production, hunting and related service activities	10.51%	Wholesale trade, except of motor vehicles and motorcycles	9.48%
Food products	2.23%	Retail trade, except of motor vehicles and motorcycles	4.62%	Retail trade, except of motor vehicles and motorcycles	6.72%
Services of head offices; management consulting services	1.78%	Services of head offices; management consulting services	4.41%	Services of head offices; management consulting services	3.27%
Land transport and transport via pipelines	1.63%	Land transport and transport via pipelines	3.33%	Land transport and transport via pipelines	3.25%

Results – Scenario analysis

Variable	Computation	Scenario 1	Scenario 2
Change in quantity of cigarettes consumed	$\Delta Q_t^{TP} = Q_{t-1}^{TP}\left(1 + \epsilon_p \frac{\Delta P_t^{R,TP}}{P_{t-1}^{R,TP}}\right) - Q_{t-1}^{TP}$	**-8.45%**	**-14.75%**
Change in consumption of households for tobacco	$\Delta EXP_t^{R,TP} = \left(P_{t-1}^{R,TP} + \Delta P_t^{R,TP}\right)(Q_{t-1}^{TP} + \Delta Q_t^{TP}) - P_{t-1}^{R,TP} Q_{t-1}^{TP} > 0$	**3.28%**	**4.30%**
Crowding out effect	$-\Delta EXP_t^{CO;R,*} = \Delta EXP_t^{R,TP}$	**-3.28%**	**-4.30%**
Change in government revenues	$\Delta REV_t = \Delta REV_t^{TP} + \Delta REV_t^{*}$	**7.08%**	**10.49%**
Change in supply of tobacco products	$\Delta EXP_t^{B,TP} = P^{B,TP} \Delta Q_t^{TP}$	**-9.24%**	**-17.30%**

Results – Simulations (employment example)



Conclusions

- The analysis shows that net impact of increase in tobacco taxation on output, income and employment is positive regardless of the assumed structures of government spending, as long as government reallocate at least 80% of additional revenues from tobacco taxation.

- Joint consideration of the simulation outcomes indicates that higher weighting of health services, social work activities and education within the structure of additional government spending is positively associated with overall net impact on output, income and employment.

Policy recommendations

- **Dedicating increased revenues from higher tobacco excises for health, social security and education purposes.**

- **Legal obligation of government to spend certain amount of excises on socially desirable outcomes - ** would not be only beneficial from the macroeconomic point of view (as demonstrated in this study), but also increase support of taxpayers, including those who are smokers, for higher taxation of tobacco products.