POLICY BRIEF
Dec. 2024.

Small, regular and predictable increase in cigarette prices diminishes efficiency of tobacco taxation

KEY FINDINGS

Demand for cigarettes goes down whenever price of cigarettes goes up, but size of decline in cigarette consumption depends on:

- **size of increase in cigarette prices – the shrink in demand for cigarettes is not proportional to change in prices as larger increase in cigarette price is more efficient in reducing consumption relative to moderate increase.**
- **predictability of changes in cigarette prices - unanticipated increase in prices of cigarettes results in unproportionally higher decline in intensity of consumption relative to moderate increase in prices.**

Background and methodology

Following the ratification of FCTC (Framework Convention on Tobacco Control) in 2006, Serbia started to implement tobacco control measures, including the introduction excise calendar. The initial effects of the introduction of tobacco control measures and excise calendar in Serbia were quite successful, **but since 2015 intensity and prevalence of smoking has been declining at considerably lower pace** (Table 1).

Over time, industry has responded to excise calendar by constant semi-annual increase in retail price of 10 RSD (approximately 0.08 EUR) regardless of the growth in specific excise, which eventually resulted in **small, regular and predictive change in cigarette retail prices** since 2015 (Figure 1), that roughly corresponds to period of stagnation of smoking prevalence and intensity.

Association between change in cigarette prices and change in cigarettes consumption is typically quantified by the total price elasticity of demand. For instance, over the period 2006-2022, total price

Table 1. Cigarette use in Serbia, 2006-2022

Year	Prevalence (% of smoking households)	Number of packs smoked monthly per household
2006	49.75%	39.11
2010	38.82%	36.99
2014	34.44%	27.69
2018	32.23%	28.84
2022	30.31%	26.94

Source: authors' calculation based on HBS data

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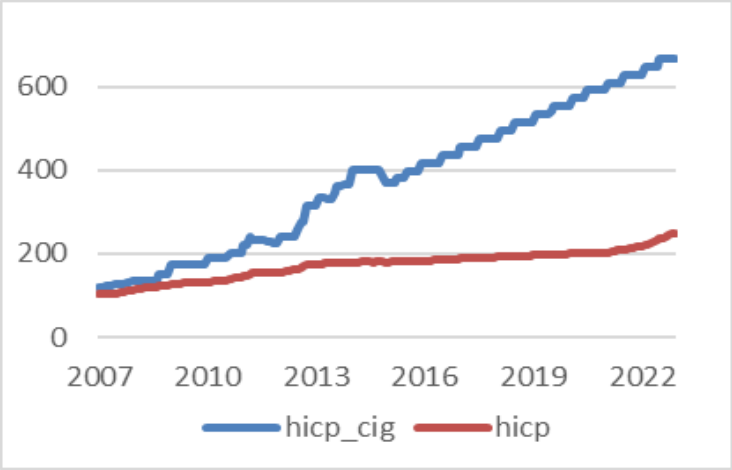
Figure 1. Indices of consumer prices (2006=100), overall (hicp) vs cigarettes (hicp_cig), 2007-2022



Source: authors' calculation based on HBS data

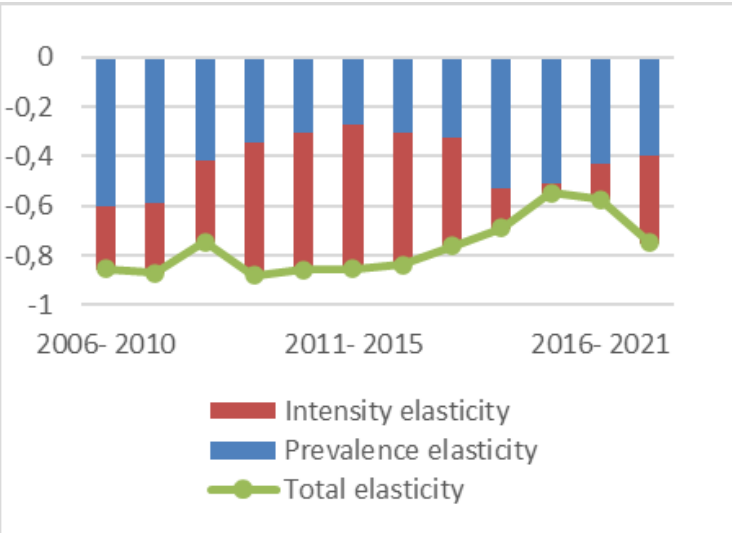
elasticity of demand was -0.67, which means that **1% change in price of cigarettes in Serbia leads to 0.67% decline in cigarette consumption**.

Total price elasticity can be further decomposed to **prevalence elasticity** that shows reduction of demand due to smoking cessation, and **intensity elasticity** that shows reduction of demand due to lower quantities of cigarettes smoked by current smokers.

Main results

Previous research in other countries shows that price elasticity of demand for cigarettes can vary over time, reflecting structural changes in smokers behavior. When price elasticities are estimated for the 5-year rolling subperiods in Serbia, variations in total elasticity and its components over time are also observed (Figure 2).

Figure 2. Time-varying price elasticity of demand for cigarettes, 5-year rolling subperiods from 2006-2010 to 2016-2021



Source: authors' calculation based on HBS data

The intertwining between variations in price elasticity and size/predictability of change in cigarette prices is further scrutinized to provide answers to the following questions:

Does the size of price change affect the size of the respective response of demand for cigarettes?

Findings suggest a negative association between total price elasticity and price change, which means that **larger increase in price leads to the higher shrink in demand for cigarettes** (relative to small

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changes in price), being primarily driven by negative correlation between change in price and price intensity elasticity (Figure 3).

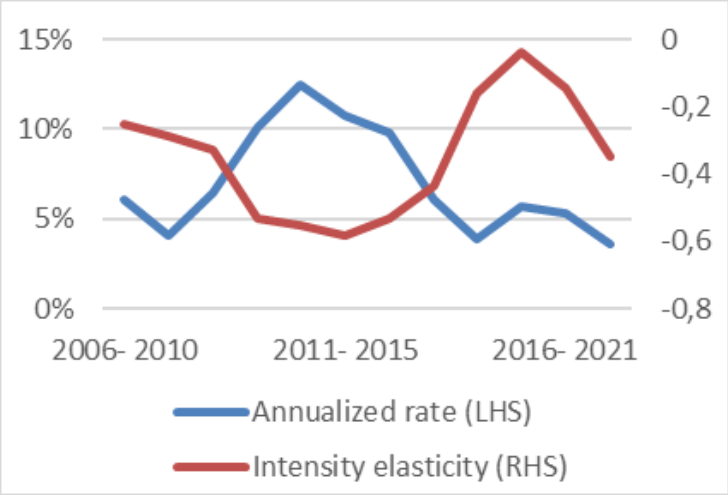
Does the price elasticity of smoking prevalence decline over time?

This question is closely related to the hardening hypothesis, which proposes that as smoking prevalence declines the proportion of "hardcore" smokers will increase. Subsequently, prevalence elasticity is expected to increase (decrease in absolute size), as smokers heavily addicted to nicotine got less responsive to the change in price. Nevertheless, time series of estimated prevalence elasticities (Figure 2) indicates that despite volatility in size, no trend of increase in price prevalence elasticity is observed.

Does the predictable dynamics and size of price changes affect the respective response of demand for cigarettes

The absolute size of total price elasticity in the subperiod of uneven increase in prices (2006-2014) is considerably larger (1% price increase -> 0.83% decline in demand) when compared to the case of predictive change in prices (2015-2022), when total elasticity is estimated at -0.68 (1% price increase -> 0.68% decline in demand). This difference comes from the intensity component of price elasticity, as intensity of smoking seems to be two times higher in the first subperiod than in the subperiod of high pricing predictability.

Figure 3. Correlation between **intensity elasticity** and **annualized rate of change in cigarette prices**, 5-year rolling subperiods from 2006-2010 to 2016-2021



Source: authors' calculation based on HBS data

Table 2. Price elasticity estimated, 2006-2014 vs 2015-2022

	2006-2014	2015-2022	Difference
Total	-0.8339	-0.6837	-0.1502
Prevalence	-0.3728	-0.4398	0.0670
Intensity	-0.4609	-0.2471	-0.2138

Source: authors' calculation based on HBS data

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POLICY RECOMMENDATIONS

Policy of moderate and regular increases in tobacco taxes should be avoided, as such a policy in the long run lead to high predictivity of increase in retail prices and eventually to ineffective outcomes in reducing demand for cigarettes

Serbia is currently running the policy of highly predictable and regular moderate changes in tobacco taxation, and the ineffectiveness of such policy become visible through recent stagnation in prevalence rate and smoking intensity. As indicated by the research results, the unanticipated sharp increase in prices of cigarettes seems to severely affect smokers, whose intensity of cigarette consumption declines unproportionally higher relative to moderate increase in prices. On the other hand, anticipated changes in prices lead to predictable cigarette expenditures, which are incorporated into the budget planning of smoking households through the crowding out of other goods and services. Eventually, small, regular and predictive cigarette price increase results in an exceptionally low reduction of smoking intensity by the smoking households, making tobacco taxation ineffective.

References

Huang, B., Yang C., & Hwang, M. (2004). New evidence on demand for cigarettes; A panel data approach. *International Journal of Applied Economics*, 1(1), 81-97.

Dautzenberg, B., Dautzenberg, M. (2019). Increasing tobacco taxes by less than 5% is ineffective: Lessons from 2000-2018 surveys in France. *Tobacco Prevention & Cessation*, 5 (Supplement):A79.

Li, J., Newcombe, R., Guiney, H., & Walton, D. (2017). Impact on smoking behavior of the New Zealand annual increase in tobacco tax: Data for the fifth and sixth year of increases. *Nicotine & Tobacco Research*, 19(12), 1491–1498.

Acknowledgments

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