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The Vienna Institute for International Economic Studies
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Abstract

This study examines the dynamics of heated tobacco product (HTP) prices, sales and taxation in Serbia and assesses how the tobacco industry shapes HTP- and cigarette-pricing strategies in response to tobacco tax policy. Using monthly data on HTP and manufactured-cigarette (MC) prices and excise taxes for the 2018-2025 period, we apply fixed-effects panel regression models to estimate the pass-through of excise taxes to retail prices, complemented by descriptive analysis of market developments, consumption trends, affordability and taxation. Since the introduction of HTPs in 2018, consumption of them has steadily increased, reaching 6.25% of all tobacco packs sold in 2023. Although excise taxes on HTPs have risen substantially, retail prices have not followed at the same pace. The estimated direct pass-through of an increase of one Serbian dinar (RSD) in the HTP excise tax is RSD 0.26 and statistically insignificant, indicating that the industry absorbs a significant portion of tax increases. Excise taxes account for only 13.4% of the retail price of the leading HTP brand, compared with 61.4% for cigarettes. Aligning HTP taxation with cigarettes would reduce industry profit, improve public health and increase public revenue.

Keywords: Heated tobacco products, tobacco taxation, tax pass-through, panel data

JEL classification: H21, I18, D22

CONTENTS

TABLES AND FIGURES

Executive summary

Background

Despite the lack of evidence that heated tobacco products (HTPs) are less harmful than combustible tobacco products, many countries tax HTPs at lower rates than manufactured cigarettes (MCs). This creates substantial excise tax gaps and allows the industry to secure large profit margins from HTP sales. This study aims to provide insight into the dynamics of HTP prices, sales and taxation as well as to assess how the tobacco industry shapes HTP- and MC-pricing strategies in response to tobacco tax policy in Serbia.

Methodology

The response of tobacco product prices to changes in taxation is typically assessed by measuring the pass-through effect, which indicates how much the retail price of the product increases following a one-unit increase in its taxation. To estimate the extent to which excise taxes on HTPs (direct pass-through effect) and cigarettes (indirect pass-through effect) are reflected in retail prices, a fixed-effects panel regression modelling is applied using the monthly data on HTP and MC prices and excises for the 2018-2025 period. Descriptive statistics are used to illustrate stylised facts on the HTP market developments and to evaluate consumption trends and patterns, affordability and taxation policy.

Results

Since the introduction of HTPs on the Serbian market in 2018, their consumption has been steadily increasing, reaching 6.25% of all tobacco packs sold in 2023. Empirical analysis shows that excise taxes on HTPs have increased substantially, but HTP prices have not followed at the same pace, lowering their tax burden relative to that of cigarettes. The estimated direct pass-through effect of an increase of one Serbian dinar (RSD) in the HTP excise tax on the HTP retail price is RSD 0.26, though statistically insignificant. This indicates a weak and imprecise relationship between changes in HTP excise taxes and corresponding changes in retail prices. Taken together, the results indicate that the industry absorbed a substantial portion of the rise in HTP taxation, consistent with a pricing strategy of tax undershifting. Despite recent increases in tax rates on HTPs, excise taxes account for just 13.4% of the retail price of the top-selling HTP brand, compared with 61.4% for the leading cigarette brand, underscoring how lower HTP taxation limits government revenue.

Conclusion

Although research shows that HTPs are harmful even in the short term and that their long-term effects remain uncertain, most European governments still tax them at lower effective rates. Serbia follows this trend, applying substantially lower taxes to HTPs than to manufactured cigarettes. As a result, industry profit margins on HTPs remain far higher than on medium-priced cigarettes. Consequently, the industry promotes HTPs as ‘less harmful’ alternatives and encourages smokers to switch by maintaining HTP prices at levels comparable to the most popular medium-segment cigarette brands. To curb these practices, the tax burden on HTPs should be aligned with that on cigarettes, which would improve public health and generate additional public revenue.

1. Introduction

Heated tobacco products (HTPs) have become the fastest-growing segment of the global tobacco market in the last decade. Their expansion has influenced industry strategy and created challenges for regulatory and fiscal systems. Major transnational tobacco companies – such as Philip Morris International (PMI), British American Tobacco (BAT) and Japan Tobacco International (JTI) – have redirected substantial investment towards non-combustible product lines (e.g. HTPs, e-cigarettes and vapes, and nicotine pouches). This shift has taken place in the context of declining cigarette consumption and increasing regulatory pressure (O'Connor et al. 2022). A recent systematic review covering 42 countries found that the global prevalence of people who ever used HTPs reached nearly 5%, while current and daily use remained lower but showed consistent growth between 2015 and 2022. In the Europe region, lifetime use increased from just above 1% in 2016 to almost 7% by 2020, which confirms the speed of uptake across different markets (Sun et al. 2023). HTPs are usually promoted as the so-called 'reduced-risk' or 'cleaner' alternatives to cigarettes. These claims, together with attractive device design and intensive marketing, have supported rapid market uptake in several countries (O'Connor et al. 2022; Laverty et al. 2021). Market reports show a strong increase in the sales value of HTPs (in Europe and other regions) – and one that is often faster than the ability of regulatory and tax systems to properly adapt to changes (López-Nicolás 2024).

The expansion of this market creates connected questions for tax policy and public health. From the fiscal point of view, many excise systems were originally designed for conventional manufactured cigarettes (MCs), which are usually taxed per pack with a combination of specific and ad valorem rates. HTPs have often been treated differently, such as by being taxed per kilogram of tobacco. These arrangements create substantial and sometimes persistent differences in tax burden between product types. When tax bases and rates differ across products, two related problems typically appear. The first is tax arbitrage and industry strategies that can weaken the intended revenue or price effects of excise increases. The second is consumer substitution between products in reaction to relative price differences (Dauchy and Shang 2023; Sheikh et al. 2023). The combination of strong industry positioning and poorly aligned tax design can therefore produce negative outcomes for both public revenue and population health.

This study examines the case of Serbia. HTPs entered the Serbian market in 2018, and its local excise system still applies specific rules to HTPs that are different from those applied to cigarettes. The specific excise on HTPs is calculated per kilogram of tobacco, and there is a phase-calendar that links HTP excise to the minimum excise level for cigarettes. This legislative structure, along with observable industry pricing strategies, makes Serbia a suitable case-study country for empirically analysing how excise design and industry behaviour influence retail prices, affordability and (indirectly) consumption.

2. Literature Review

Over the past decade, HTPs have attracted growing attention in public health research, particularly regarding their potential impact on health outcomes. A systematic review and meta-analysis of 40 studies published between 2010 and 2024 (Braznell et al. 2025) showed that the effects of HTP use on biomarkers (e.g. cardiovascular, inflammatory and other health-related indicators) cannot be clearly determined. The inconsistency in findings stems from heterogeneity and from multiple sources of bias. For example, most published trials are sponsored by the tobacco industry, short-term studies tend to report fewer negative effects of HTPs compared to cigarettes or e-cigarettes, and many industry-sponsored studies lack transparency and show notable methodological limitations. A similar conclusion can be drawn from an earlier systematic review (Znyk et al. 2021), which included 25 studies published from 2015 to 2021. The findings were similarly mixed, with important confounding factors insufficiently controlled. The authors emphasise that methodologically rigorous and longitudinal studies are needed to more clearly determine the health effects of HTP use. On the other hand, an analysis of 55 studies published between 2021 and 2025 (Znyk and Kaleta 2025), with most of them not being funded by the tobacco industry, indicated that the use of HTPs tends to be positively associated with the occurrence of respiratory syndromes, metabolic diseases and reproductive-health issues. However, as the authors conclude, most of the included studies are cross-sectional and observational, which limits the causal interpretations.

The inconsistency is even more pronounced in recent systematic reviews, which indicate that switching from conventional cigarettes to HTPs or e-cigarettes may reduce exposure to harmful substances and improve certain health indicators compared to continued use of traditional cigarettes. Ambidhok et al. (2025) reported that HTP users may experience certain improvements in respiratory and oral health as well as lower markers of inflammation, while Cao et al. (2025) reported that exposure to carcinogenic compounds is reduced in smokers who switched to HTPs or e-cigarettes. However, in both reviews, the authors highlight that HTPs are not risk-free and that conclusions are based on short-term studies, which imposes the need for cautious interpretation and further studies, especially long-term trials. A recent narrative review (Upadhyay et al. 2023) reinforces these concerns. As the authors emphasise, although HTPs may contain lower concentrations of certain toxicants, they also include unique toxicants, so independent long-term studies are needed to clarify the association between HTP use and health risks.

The rapid spread of HTPs is well documented in recent research. Newer-generation devices (e.g. IQOS, Glo and Ploom) have reached high market penetration in some countries (especially Japan) and non-negligible prevalence in EU member states (Laverty et al. 2021; O'Connor et al. 2022). Eurobarometer data show notable levels of ever-use and a smaller but significant share of current users in Europe. Younger age groups and current or former smokers are more likely to report HTP use. Dual use with combustible tobacco is common among individuals who have tried HTPs (Laverty et al. 2021). The study from Montenegro indicates particularly fast HTP market growth in the country, where industry marketing is focused on mid-price cigarette smokers (Čizmović et al. 2024). Recent comparative data also help to locate Serbia within this regional pattern. In 2019, lifetime HTP use among adolescents in Serbia was around 6.6%, while current use reached 3.2%. These levels place Serbia near the regional midpoint.

Higher prevalence was observed in Bulgaria, Czechia, Latvia and Slovakia, whereas Montenegro, North Macedonia and Slovenia recorded lower rates (Sun et al. 2023).

Changes in taxes and prices influence not only government revenue but also product affordability and health outcomes. When HTPs become relatively more affordable (e.g. due to under-shifting or slower growth of excise), their use can increase. This may include initiation among younger populations and dual use together with cigarettes (Laverty et al. 2021; Čizmović et al. 2024).

Understanding demand elasticities for HTPs is important for assessing the effects of taxation. Cross-country empirical studies show that demand for HTPs is more price-elastic than demand for cigarettes. Estimated own-price elasticities for HTPs are in the elastic range, approximately from –1.0 to –1.3, while cigarette demand is usually less elastic, at around –0.3 (Dauchy and Shang 2024; Qian 2024). This difference suggests that tax increases on HTPs could lead to substantial reductions in HTP consumption. At the same time, without coordinated taxation across products, such tax changes may not lead to a proportional increase in cigarette consumption. Cross-price effects are also asymmetric. Higher cigarette prices tend to increase HTP demand more strongly than equivalent increases in HTP prices reduce cigarette consumption (Dauchy and Shang 2024). These results indicate the importance of coordinated tax policy across product categories in order to prevent substitution.

An increasing number of empirical studies analyse how excise taxes are transmitted to retail prices (tax pass-through) for cigarettes and HTPs. Cross-country evidence shows a clear contrast. Changes in cigarette excise are often over-shifted to retail prices, meaning that price increases exceed the tax change. In the case of HTPs, tax increases are frequently under-shifted, and a significant part of the additional tax is absorbed by the industry instead of being reflected in the final price (Dauchy and Shang 2023). Hence, a lower relative tax burden on HTPs does not necessarily result in lower consumer prices. Manufacturers often retain higher margins and use price and product-portfolio strategies to control their market position. Policy analysis at the European Union (EU) level also shows that even the proposed revisions of the Tobacco Tax Directive could leave space for undervaluation and for the industry to capture tax advantages if minimum floors and weighted-price bases are not clearly defined (López-Nicolás 2024).

Systematic reviews and country-level studies show that the tobacco industry applies various strategies to limit the effectiveness of excise taxes. These include differential tax shifting across product segments (over-shifting for premium brands, under-shifting for cheaper brands), product engineering (e.g. shrinkflation or changes in pack size), the introduction of new lower-priced variants to encourage down-trading, targeted promotions and price discrimination (Sheikh et al. 2023). The data from Montenegro provides a concrete example. Large tax increases on HTPs were followed by much smaller increases in retail prices, which indicates strong under-shifting. In such cases, the impact of taxation is mainly absorbed by manufacturers instead of being reflected in consumer prices or government revenue (Čizmović et al. 2024; Mugoša 2023). These strategies are especially effective in markets with weak price monitoring or where the tax base allows per-weight valuation, which can be adjusted through changes in stick weight or pack composition.

3. Methodology and Data

On the Serbian market, HTPs are currently sold by three global tobacco companies (PMI, BAT, JTI), which collectively offer five device lines and seven tobacco brands with numerous brand variants (plus one tobacco-free brand). The HTP brand variants are horizontally differentiated products within the same brand that differ in taste characteristics while being sold at a uniform price. The HTP brands available on the Serbian market (Q1 2025) as well as their respective prices and market shares are presented in Table 1. PMI has dominated HTP sales since entering the market in 2018. According to the data from an unpublished field survey on market share conducted in 2025 by Serbia's Institute of Economic Sciences (IES), the PMI brands (i.e. Heets, Terea and Fiit) account for approximately two thirds of total HTP consumption. BAT introduced its heating device and sticks in 2019. The estimated market share of BAT's HTP brands (i.e. Neo, LS, Virto and Rivo) is around 27%. JTI entered the market only recently (2024), and the market share of its brand is considerably lower than those of PMI and BAT.

Table 1 / HTP brands sold on the Serbian market

Company	Device line	Brand	Price per HTP pack in RSD	Market share (%)
PMI	IQOS	Heets Terea	370	58.8
PMI	Lil Solid	Fiit	350	7.5
BAT	Glo	Neo Lucky Strike	350 320	17.5 5.2
BAT	Hilo	Virto Rivo (tobacco-free)	360	4.6
JTI	Ploom	Winston	340	6.4

Note: A pack of HTP contains 20 sticks across all brands available on the Serbian market. Prices as of March 2025.
Source: Unpublished 2025 survey conducted by Serbia's Institute of Economic Sciences (IES) to collect data on the use of HTP products in Serbia (N = 1,000 respondents).

3.1. DATA

Since the records on the volumes and prices of tobacco products' sales by brands are not publicly available in Serbia, data on HTP prices per kilogram of tobacco are collected from the Official Gazette for the period from Q3 2018 (when PMI first introduced HTPs on the Serbian market) to Q1 2025. Based on announced prices in the Official Gazette, the time series of the monthly prices by HTP brands are generated. Such an approach implies several limitations, bearing in mind that the HTP market is very dynamic, as heating technology, HTP brands and brand varieties have been frequently changing over the observed period. More specifically, the following issues have emerged during data collection:

1. In the Official Gazette, HTP prices are announced not per pack but per kilogram of tobacco. This is the opposite of the case with MCs, whose prices are announced per pack. Recalculations of the HTP prices per pack based on announced prices per kilogram revealed that the introduction of new brands and brand varieties is often connected to changes in the quantity of tobacco per HTP pack.

2. The periodical introduction of new brands (or brand varieties) is typically followed by a gradual termination of the sales of old brands after some overlapping period in which both new and old brands are sold simultaneously. Without data on sales, the exact length of these overlapping periods is not possible to determine precisely.

BOX 1 / CONSTRUCTING TIME SERIES OF HTP PRICES

In the absence of data on HTP prices per pack, the prices per kilogram of HTP tobacco are transformed into prices per pack in the following way. We started from the current price of HTPs per pack observed in cigarettes stores (column 'Price per HTP pack in RSD' in Table 1) and then computed the number of packs per kilogram of HTP tobacco as price per kilogram / price per pack. For instance, in Q1 2025, the price per kilogram of tobacco for the Terea brand was RSD 69,811.32 and the price per pack was RSD 370, so the number of packs per kilogram of tobacco is calculated as 69,811.32/370 = 188.68. Similarly, we compute the current quantity of tobacco per pack as 1,000 grams / number of packs. In the particular case of Terea, dividing 1,000 by 188.68 gives exactly 5.3 grams per pack.

Bearing in mind the practice of the industry in Serbia to increase the prices of cigarettes and HTPs by exactly RSD 10 after each excise increase (regardless of its size), we recursively compute prices per pack whenever a change in the price per kilogram of HTP tobacco is announced in the Official Gazette and then check for consistency in terms of number of packs per kilogram/grams per pack.

Subsequently, a monthly time series of prices is generated in line with previous calculations and changes in the per kilogram prices of HTP tobacco announced in the Official Gazette. For instance, if the Official Gazette dated 7 September 2023 announced that the new price of a kilogram of Terea tobacco was RSD 64,150.94, we computed the price per pack of Terea (RSD 340 in this case) and set this price for the September 2023-January 2024 period, as the new price of a kilogram of Terea tobacco was announced on 6 February 2024.

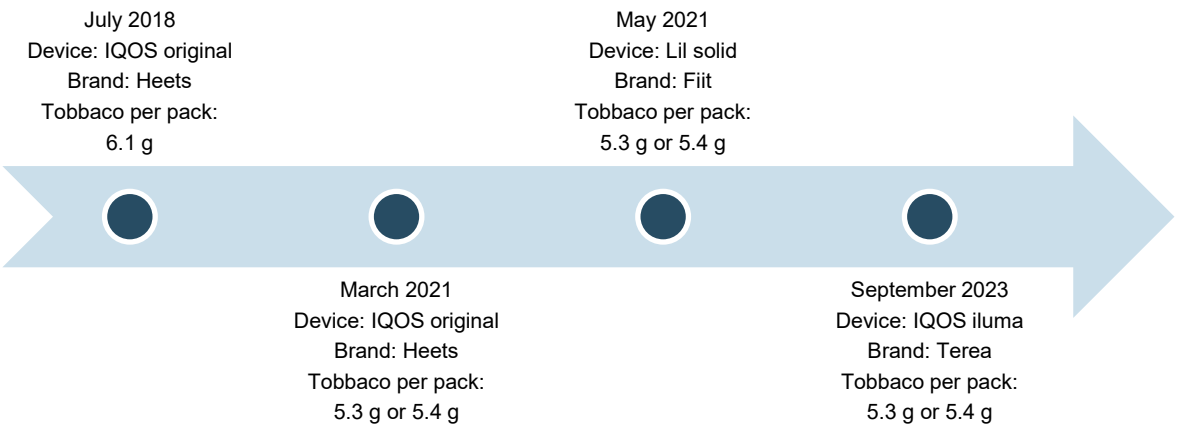
The previous two issues are illustrated by Figures 1a and 1b, which display the timeline of the introduction of HTPs on the Serbian market by PMI and BAT. In the case of the PMI, the quantity of tobacco per pack has stabilised at 5.3 grams for all of its brands (5.4 grams for some brand varieties), while in the case of BAT, the quantity of tobacco per pack has significantly varied across brands. The variations in tobacco quantity, especially in the case of BAT's HTP products, are most likely connected to changes in heating devices and technology.

3. The lack of data on sales volume by brands does not allow us to compute the weighted average retail price (WARP) of HTP packs on a monthly basis. To overcome this issue, we used prices of representative brands as the price measure. In the case of BAT, Neo is considered a representative brand because it has had a continuous presence on the market since its introduction as well as continuity in pricing despite significant variations in tobacco weight (as illustrated in Figure 1b). On the other hand, as the representative HTP brand of PMI, Heets was replaced by Terea in 2023, following the significant change in technology of heating. Since a pack of Terea was priced the same as a pack of Heets when the former was introduced on the market, the time series of HTP representative prices for

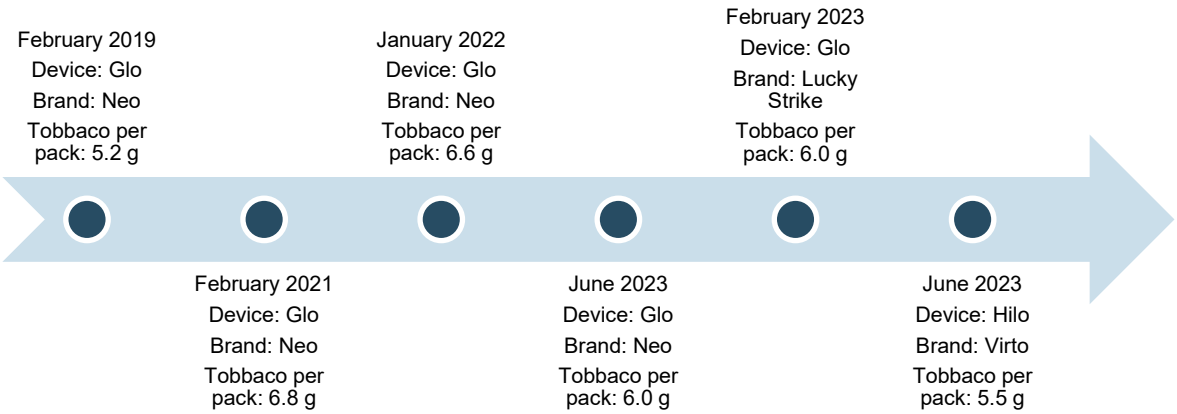
PMI was compiled by merging data on Heets and Terea. It should be noted that prices of brand varieties are uniform, with very rare exceptions, within a given HTP brand.

Figure 1 / Timeline of PMI's and BAT's introduction of HTPs in Serbia

a) Timeline of PMI's introduction of HTPs



b) Timeline of BAT's introduction of HTPs



Note: The timeline refers to dates when the given brand appeared for the first time in the Official Gazette or when the change in quantity of tobacco occurred.
Source: Official Gazette; authors' calculation

3.2. EMPIRICAL APPROACH

The research methodology consists of panel regression analysis that relates (i) the taxation of HTPs to the prices of HTPs (direct pass-through) and (ii) the taxation of MCs to HTP prices (indirect pass-through), using the monthly data on HTP/MC prices and excises for the 2018-2025 period. The methodological approach is primarily based on the recent studies of Dauchy and Shang (2023) and Čizmović et al. (2024). In addition, descriptive statistics that combine aggregate data from the official sources (Ministry of Finance, Tobacco Administration, Statistical Office) are presented to illustrate stylised facts on the HTP market and consumption trends and developments in Serbia.

The response of tobacco product prices to changes in taxation is typically assessed by measuring the direct pass-through effect, which indicates how much the retail price of the product increases following a one-unit increase in its taxation. For example, a direct pass-through effect of 1 means that an increase of RSD 1 in taxation results in an exactly proportional increase of RSD 1 in the retail price of the product. A pass-through effect of less than 1 suggests that the industry absorbs part of the tax increase instead of passing the full amount on to consumers, a pricing strategy known as tax under-shifting. To estimate the extent to which excise taxes on HTPs and MCs are reflected in retail prices (i.e. direct and indirect pass-through effects), a fixed-effects panel regression model is applied. The baseline model specification M1 is defined as:

$$P_{it}^{HTP} = \beta T_{it}^{HTP} + \delta X_{it} + \varepsilon_{it} \quad (1)$$

where P_{it}^{HTP} denotes the retail price of HTP brand i in month t, T_{it}^{HTP} represents the excise tax per pack of HTPs, β denotes the direct pass-through effect, and X_{it} is a vector of macroeconomic controls (e.g. wage growth, consumer price index). Consequently, the case of tax under-shifting corresponds to $\beta < 1$.

To assess the indirect influence of cigarette taxation on HTP prices, a comparable model is estimated in which T_{it}^{HTP} is replaced with cigarette excise taxes (i.e. the sum of the specific and ad valorem taxes) per pack T_{it}^{CIG} for mid-range or premium market segments. Two versions of this model are specified: version M2, which includes only the cigarette excise,

$$P_{it}^{HTP} = \beta T_{it}^{CIG} + \delta X_{it} + \varepsilon_{it}, \quad (2)$$

and version M3, which includes both the HTP and cigarette excises,

$$P_{it}^{HTP} = \beta_1 T_{it}^{HTP} + \beta_2 T_{it}^{CIG} + \delta X_{it} + \varepsilon_{it}. \quad (3)$$

In addition to single-equation estimations, a Seemingly Unrelated Regression (SUR) approach is applied to jointly model the retail pricing behaviour of HTPs and cigarettes. This allows for contemporaneous correlation between the error terms of the two pricing equations, capturing potential interactions in producers' pricing strategies across related tobacco product markets. Therefore, model M4 is specified as follows:

$$\begin{cases} P_{it}^{HTP} = \alpha_1 + \beta_1 T_{it}^{HTP} + \beta_2 T_{it}^{CIG} + \delta_1 X_{it} + \varepsilon_{1it} \\ P_{it}^{CIG} = \alpha_2 + \gamma_1 T_{it}^{HTP} + \gamma_2 T_{it}^{CIG} + \delta_2 X_{it} + \varepsilon_{2it} \end{cases}, \quad (4)$$

where P_{it}^{CIG} is the retail price of cigarette brand i in month t.

To analyse the relationship between tax and price differentials between HTPs and MCs, the additional model M5 is specified with the tax gap defined in nominal terms:

$$G_{it}^{P} = \beta G_{it}^{ET} + \delta X_{it} + \varepsilon_{it} \quad (5)$$

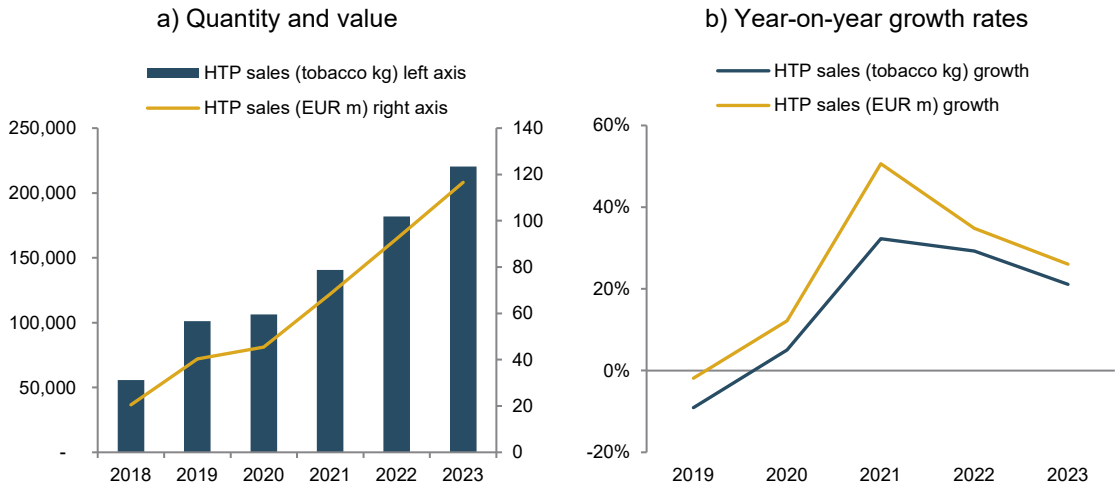
where G_{it}^{P} is the gap between MC and HTP retail prices, $G_{it}^{P} = P_{it}^{CIG} - P_{it}^{HTP}$, and G_{it}^{ET} represents the difference between their respective total excise taxes, $G_{it}^{ET} = T_{it}^{CIG} - T_{it}^{HTP}$. A positive coefficient implies that higher tax differentials are associated with wider price gaps.

4. HTP market overview

4.1. SALES

Analysis of HTP sales was conducted based on aggregated data on the value of tobacco product sales obtained from Tobacco Administration for the 2018-2023 period. Since HTPs were introduced on the Serbian market in July 2018, consumption of HTP tobacco has been constantly on the rise (Figure 2a), although with different dynamics. Initial consumption growth in 2019 and 2020 was sluggish, most likely due to hesitation of smokers to switch from traditional tobacco products to HTPs. However, the quantity of HTP tobacco sold substantially increased over the 2021-2023 period; HTP tobacco sold in 2023 was 2 times higher than in 2020. At the same time, the increase in the quantity of HTP tobacco sold was accompanied by an increase in the value of HTP sales.

Figure 2 / HTP tobacco sales



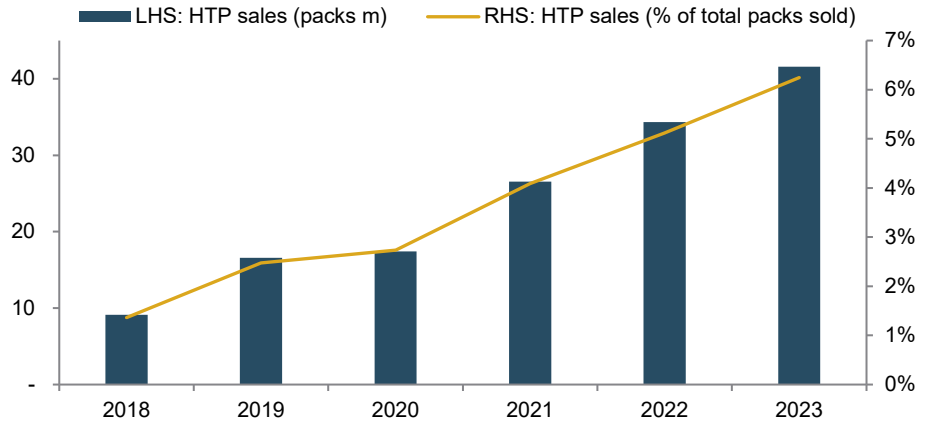
Note figure 2b: The rate for 2019 is annualised.
Source: Tobacco Administration; authors' calculation

Figure 2b illustrates that there was a noticeable change in the speed of growth in 2021, both in quantity and sales value. This divergence corresponds to the decrease in the quantity of tobacco per pack of Heets (presented in Figure 1a), bearing in mind that PMI's HTP brands dominate the market. In fact, it is likely that this decrease in tobacco quantity per Heets pack increased the profit margin and made HTPs even more profitable for PMI, assuming that the production cost of a pack of HTPs is proportional to the quantity of tobacco contained in the pack.

HTP sales increased not only in absolute terms, but also in relative terms compared to traditional tobacco products, such as MCs and roll-your-own (RYO) tobacco. For the sake of analysis, the HTP tobacco sales are transformed into number of packs by dividing the quantity sold by the quantity of tobacco per pack. In a similar manner, RYO tobacco sales are transformed into number of packs,

assuming that one rolled cigarette contains between 0.7 and 1.0 grams of tobacco, as in the case of MCs. Figure 3 displays an estimated number of HTP packs sold and respective shares in total number of packs sold on the tobacco products market. In 2019, which was the first full year of HTPs' presence on Serbia's tobacco market, the share of HTP packs in total number of packs sold was around 2.5%. By 2023, this share had increased to 6.25%.

Figure 3 / HTP packs sold as a share in total packs sold on Serbia's tobacco products market



Note: Tobacco product market includes sales of MCs (packs), HTP tobacco (transformed into packs), and RYO tobacco (transformed into packs)
Source: Tobacco Administration; authors' calculation

4.2. PRICES

As noted earlier, it is not possible to compute the weighted average retail price (WARP) for either HTPs or MCs on a monthly basis since data on monthly sales are not available. Therefore, the price dynamics of HTPs are analysed using the prices of Heets/Terea, as it is a representative brand for the market as a whole. Table 2 shows the average annual prices of Heets/Terea in nominal and real terms. When nominal prices are considered, there is an obvious trend of price increases both in the national currency and in euros (the RSD/EUR exchange rate did not significantly vary over the given period). However, real prices revealed that the trend of real prices growth in the first years of HTPs' presence on the market sharply reversed in 2022, and a pack of HTPs was cheaper in real terms in 2023 and 2024 than it was in 2018. Bearing in mind that the average wage in Serbia has also been growing in real terms in recent years, the affordability of HTPs substantially increased.

Figure 4 displays the monthly dynamics of Heets/Terea prices vis-à-vis representative mid-range and premium cigarette brands. Since Heets/Terea are products of PMI, representative MC brands are also selected from the PMI portfolio. According to Tobacco Administration data, L&M Loft XL (Blue) has been the top-selling PMI brand of MCs on the Serbian market for years and therefore a suitable representative brand for the market segment of medium-priced cigarettes. Marlboro (Red) is picked as the representative premium brand, as is usual in the literature.

The joint dynamics of HTP and cigarette prices reveal interesting details on the industry strategy for HTP pricing and positioning on the market. When introduced in Serbia, HTPs were priced in the middle of the

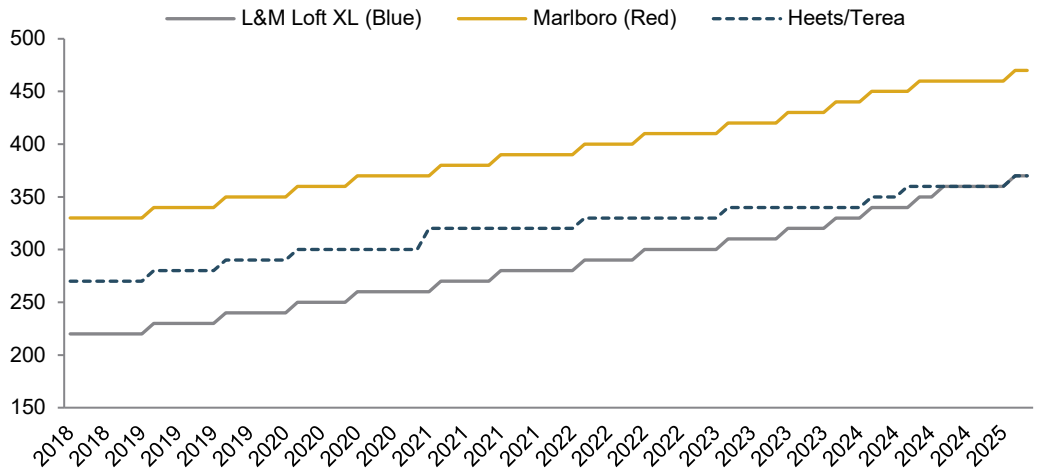
price range between mid-range and premium MC brands. Over the years, HTP prices have been increasing at a slower pace than those of cigarettes. Subsequently, the price gap between HTPs and premium-brand MCs has widened, while the prices of HTPs and medium-brand MCs eventually converged. This indicates that the primary target group for the further expansion of HTPs are smokers of medium-priced MCs. These smokers come from the low- and medium-income population, which is typically more sensitive to changes in tobacco prices (i.e. have higher price elasticity).

Table 2 / Average annual prices of the top-selling HTP brand (PMI's Heets/Terea) per pack

Year	RSD	RSD real (2006=100)	EUR	Real wage growth, in %
2018	270	138	2.28	
2019	283	143	2.40	8.37
2020	299	149	2.54	7.68
2021	320	153	2.72	5.30
2022	329	141	2.80	1.67
2023	339	129	2.89	2.10
2024	356	129	3.04	9.03
2025	367	130	3.13	4.87

Note: 2018 only Q3 and Q4; 2025 only Q1
Source: authors' calculations

Figure 4 / Prices of the representative HTP brand vs. prices of the representative medium-priced and premium cigarette brands, monthly in RSD

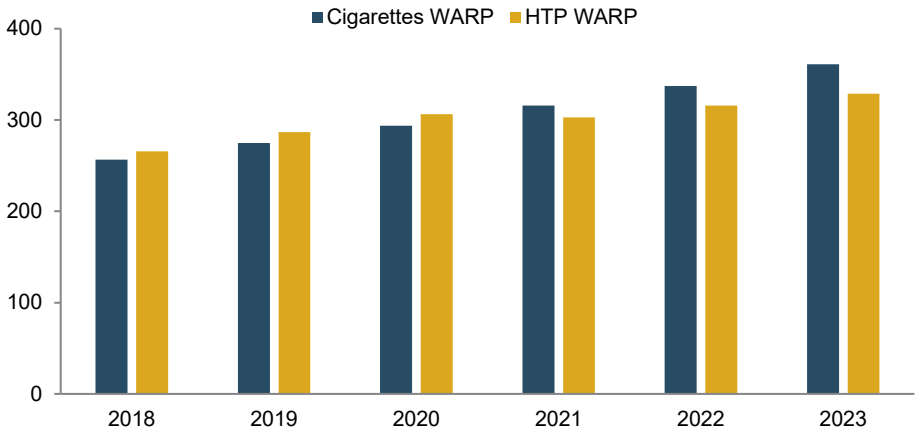


Note: Heets/Terea – representative HTP brand; L&M Loft XL (Blue) – representative mid-range brand; Marlboro (Red) – representative premium brand.
Source: authors' calculations

Another interesting insight into the pricing strategies of industry is provided by comparing HTP WARP and overall MC WARP (Figure 5). While monthly dynamics of WARP are not available, it is possible to compute annual values of WARP based on the data provided by the Tobacco Administration. WARP is computed by dividing total value of sales by total number of packs sold (or the estimated number of packs sold in the case of HTPs), which is in line with official method of computing WARP prescribed by the Law on Excise. The joint dynamics of MC and HTP WARP revealed that HTPs were initially priced a

bit higher than the average MC. However, MC WARP has been growing faster than HTP WARP since 2021, indicating the tendency of the industry to make HTPs more affordable than cigarettes on average.

Figure 5 / Cigarette WARP vs. HTP WARP, annually in RSD



Source: Tobacco Administration; authors' calculation

4.3. TAXATION

The taxation of HTPs is stipulated by the Law on Excise (LoE). Since this law envisaged the introduction of HTPs in a timely manner, HTPs were taxed from the very beginning. In contrast to cigarettes, which are subject to both specific and ad-valorem excise per pack, HTPs are taxed solely through a specific excise per kilogram of tobacco. The LoE stipulates that the excise duty on heated tobacco is levied per kilogram of tobacco mixture at a rate determined by the minimum excise for cigarettes (with any changes in the minimum to be announced twice per calendar year), while the minimum excise for cigarettes is based on the WARP of the previous year (with changes to be announced once per year). More specifically, the excise duty on HTPs has been calculated as percentage of the minimum excise on cigarettes according to the following schedule:

› 40% for the period from 2018 to 31 December 2020;

› 60% for the period from 1 January to 31 December 2021;

› 70% for the period from 1 January to 31 December 2022;

› 80% for the period from 1 January to 31 December 2023;

› 90% for the period from 1 January to 31 December 2024;

› 100% from 1 January 2025.

The above implies that the taxation of HTPs was jointly driven by decisions on minimum excise (i.e. value of the minimum excise for MCs) and the provisions of the LoE (i.e. proportion of minimum excise applied to HTPs), as it is more complex than the taxation of MCs, which solely depends on announced values of specific excise for cigarettes (Table A1 in the Appendix). Table 3 displays values of excise imposed on HTPs in the Q3 2018-Q1 2025 period. The 'Legislation' column shows drivers of HTP excise change: 'OG' refers to the announcement of decisions on a new minimum excise published in the

Official Gazette, while 'LoE' refers to the changes automatically imposed by the LoE following the schedule above. Regarding HTP excise duty calculations over the given period, two types of practices can be observed:

› Ruled-based determinations from mid-2018 to 2021: HTP excises were determined based on minimum excise/WARP in a transparent manner. As can be seen in Table 3 below, the WARP was announced in the Official Gazette once a year and the minimum excise twice a year, as stipulated by the LoE.

› Discretionary determinations from 2021 to 2024: In this period, the WARP was not published at all as a basis for determining the minimum excise. The minimum excise was instead determined in a non-transparent manner, especially in 2022 and 2023, when the values of the minimum excise were not mentioned in the Official Gazette. Nevertheless, documents of the Custom Administration that provide an overall overview of changes in taxation for all products subjected to excise duties revealed that the minimum excise did not officially change for more than two years (from July 2021 to October 2023) despite a considerable increase in the estimated WARP (see Figure 5).

Table 3 / Excise on HTPs and minimum excise on MCs

Legislation	Came into force	WARP	Min. excise per 20-stick pack (20 g of tob.)	Min. excise per 1,000 sticks (1 kg of tob.)	Excise per kg of HTP tob.
OG 52/18	07.07.2018	241.42	147.42	7,371.00	2,948.40
OG 84/18	03.11.2018		148.86	7,443.00	2,977.20
OG 12/19	23.02.2019	256.16	155.23	7,761.50	3,104.60
OG 51/19	20.07.2019		156.75	7,837.50	3,135.00
OG 91/20	27.06.2020	274.24	164.23	8,211.50	3,284.60
OG 104/20	01.08.2020		165.75	8,287.50	3,315.00
LoE – 60%	01.01.2021		165.75	8,287.50	4,972.50
OG 15/21	20.02.2021	293.14	173.49	8,674.50	5,204.70
OG 74/21	24.07.2021		174.99	8,749.50	5,249.70
LoE – 70%	01.01.2022		174.99	8,749.50	6,124.65
LoE – 80%	01.01.2023		174.99	8,749.50	6,999.60
OG 75/23	01.10.2023		202.13	10,106.50	8,085.20
LoE – 90%	01.01.2024		202.13	10,106.50	9,095.85
OG 94/24	06.12.2024		218.34	10,917.00	9,825.30
LoE – 100%	01.01.2025		218.34	10,917.00	10,917.00
OG 13/25	15.02.2025	393.05	233.36	11,668.00	11,668.00

Note: Official Gazette (OG), in which decisions on the minimum excise are announced. LoE = Law on Excise. Minimum excise values on 01.01.2022 and 01.01.2023 are imputed based on Custom Administration documents. WARP refers to the weighted average retail price of MCs in the previous year.
Source: Official Gazette and Custom Administration documents; authors' calculations

Eventually, at the beginning of 2025, the WARP and the respective minimum excise were announced again in keeping with the LoE. In any case, the government's failure to increase the minimum excise in 2022 and 2023 resulted in a considerable loss of tax revenues at the expense of industry profits.

Based on the values of HTP excise duties, the prices of Heets/Terea are decomposed to excise tax, VAT and net-of-tax price. Conversion of the excise per kilogram of HTP tobacco (as originally stipulated by the LoE) to excise per HTP pack is explained in Box 2.

BOX 2 / COMPUTING THE EXCISE PER HTP PACK IN SERBIA

As previously mentioned, HTPs in Serbia are taxed per kilogram of tobacco. Therefore, computing the excise on a pack of HTP tobacco requires additional computational steps.

In the first step, HTP excise per kilogram is computed based on minimum excise,

HTP excise (kg) = Min. excise (cigarette pack) * 50 (number of cigarette packs in a kg) * HTP excise/min. excise,

where HTP excise/min. excise refers to the percentage of the min. excise on cigarettes applied to HTP tobacco, as stipulated by the LoE.

In the second step, HTP excise per pack is obtained by computing HTP excise per gram of HTP tobacco and then multiplying this amount by the quantity of tobacco in an HTP pack,

HTP excise (pack) = HTP excise (kg) / 1,000 (g) * HTP tobacco weight (g/pack),

For instance, the min. excise in mid-2023 was RSD 174.99 and the respective HTP excise/min. excise ratio was 80% (see Table 3), while the quantity of tobacco in a pack of Terea was 5.3 grams (see Figure 1). The calculation of excise on a Terea pack in this case is summarised as follows:

Min. excise	RSD 174.99 per pack
HTP excise/min. excise	0.8 (80%)
HTP tobacco weight	5.3 g/pack
HTP excise (kg)	RSD 174.99 per pack * 50 packs in kg * 0.8 = RSD 6,999.60 per kg
HTP excise (pack)	RSD 6,999.60 per kg / 1,000 g * 5.3g per pack = RSD 37.10 per pack

Table 4 displays the mid-year decomposition of the Heets/Terea price. While the excise tax burden of HTPs more than doubled between 2018 and 2024, it was still much lower than the burden of MCs even when the ad valorem excise on the latter is disregarded. More specifically, in 2024, the excise on an HTP pack (20 sticks) was only EUR 0.41, or less than half of the specific excise on MCs (i.e. EUR 0.85). Since HTPs are not taxed by ad valorem excise, the profit margin of HTPs remains huge despite the gradual increase in total tax burden.

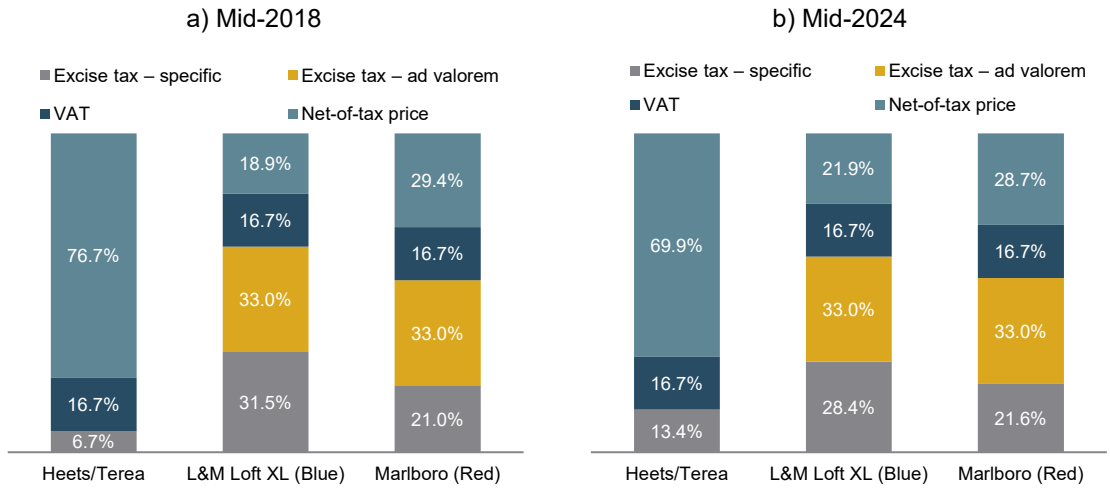
Table 4 / Price structure of the top-selling HTP brand per 20-stick pack (PMI Heets/Terea)

	Mid- 2018	Mid- 2019	Mid- 2020	Mid- 2021	Mid- 2022	Mid- 2023	Mid. 2024
Price (EUR)	2.29	2.38	2.55	2.72	2.81	2.90	3.08
Excise tax (EUR)	0.15	0.16	0.17	0.23	0.28	0.32	0.41
VAT (EUR)	0.46	0.48	0.51	0.54	0.56	0.58	0.62
Net-of-tax price (EUR)	1.68	1.74	1.87	1.94	1.97	2.00	2.05
Excise tax (%)	6.66	6.76	6.68	8.62	9.84	10.91	13.39
Total tax (%)	26.66	26.76	26.68	28.62	29.84	30.91	33.39

Source: authors' calculations

The comparison of the price structures of HTPs as well as mid-range and premium MC brands explains why the industry wants to convince MC smokers to switch to HTPs by lowering HTP prices. Figures 6a and 6b illustrate that mid-range MCs are the least profitable products with respect to the share of net price in total retail price. In 2018 (Figure 6a), the share of the net-of-tax price in the total retail price of HTPs was 2.5 times higher than that of premium MCs and, astonishingly, four times higher than that of mid-range MCs. Under the reasonable assumption that the marginal costs of producing one HTP and one MC pack are similar, it is obvious that the profitability of HTPs was extremely high. For instance, assuming that the marginal cost of producing one pack of mid-range MCs or HTPs accounted for 15% of the retail price, the profit margin in case of an HTP pack would be around 80%, compared to only 20% in the case of a pack of mid-range MCs.

Figure 6 / Price structure of representative HTP, mid-range and premium MC brands



Source: authors' calculations

While the tax burden on HTPs has increased in recent years, Figure 6b illustrates that the relations between price structures of HTPs, mid-range and premium MC brands have not substantially changed and that HTPs remained exceptionally profitable in 2024.

5. Pass-through effects of tobacco taxation on HTP prices

Given the fact that JTI entered the Serbian HTP market late and only accounts for a low share of total HTP sales in the country, the subsequent analysis focuses on the pricing strategies of PMI and BAT. Based on the previous analysis, several aspects of PMI's and BAT's HTP-pricing strategies can be observed:

› Apart from leading HTP brands sold at higher prices, both companies have one marginal brand (PMI: Fiit; BAT: Lucky Strike) sold at a lower price. The rationale for such brand differentiation could reflect the aspirations of the industry to switch at least some portion of low-income MC smokers to HTPs.

› While both companies offer a couple of variants within their brands (mostly differing by taste), neither company practices price differentiation across brand variants, probably because HTP users perceive brand variants as substitutes and a higher price of some brand variant may jeopardise its sale. However, prices per kilogram of tobacco can vary across brand variants due to different quantities of tobacco per brand variant pack.

› A comparison of the prices and tax burden of HTPs when introduced to the market with the prices and taxes of medium-priced cigarettes indicates that PMI and BAT set the price of HTPs high relative to that of medium MCs as part of a strategy to launch a novelty product with initially low sales volumes. Indeed, Figures 4 and 6a clearly indicate that PMI could set the price of Heets much closer to that of its top-selling mid-range MC brand and still gain some profit margin. Given the lack of evidence on HTP price elasticity, the best guess is that experience in countries in which HTPs were introduced earlier indicates that early HTP users are former MC smokers who switch to HTPs due to reasons other than prices (e.g. the ability to smoke indoors, the lack of odours, and beliefs that HTPs are 'healthier' than MCs).

› HTP prices have increased at a slower pace than those of cigarettes (Figure 4). Bearing in mind that MC brands from the mid-range segment are the least profitable (Figures 6a and 6b), gradual convergence of the mid-range MC prices towards HTP prices suggests that the industry most likely aspires to attract MC smokers from the medium market segment to switch to more profitable HTPs. The latter implies that the industry uses the so-called price strategy of tax under-shifting, which means that an increase in HTP taxation does not fully translate to HTP prices, which is a usual practice in the case of cigarettes (Mugoša et al. 2023).

The hypothesis of under-shifting HTP taxation to HTP prices is empirically tested using the methodological approach proposed in studies of Dauchy and Shang (2023) and Čizmović et al. (2024), as presented in the 'Empirical approach' section above. To avoid any sort of distortion that may come from highly unbalanced panel data, recently introduced brands (BAT: Lucky Strike, Virto, Rivo; JTI: Winston) are left out from the first round of estimation. The PMI brand with marginal market share (Fiit) is also left out from the first round of estimation since its price changes are perfectly correlated with those of Heets/Terea. Therefore, the regression modelling of the direct pass-through effect is initially applied to a balanced panel dataset that only contains the prices and tax burden of key PMI and BAT

HTP brands (Heets/Terea and Neo, respectively). To test indirect pass-through, the prices and taxation of the respective top-selling MC brands from the mid-range and premium segments are included: (i) PMI: L&M Loft XL Blue (mid-range) and Marlboro Red (premium); (ii) BAT: Pall Mall Longs Blue (mid-range) and Dunhill Fine Cut (premium). Although some cheap brands are available, the low-price segment is not significant in Serbia. Given that MCs from the mid-range segment are still very affordable and that smokers who opt for lower smoking costs largely switch to ROY tobacco, the focus of the analysis was on mid-range and premium MC brands.

The estimation results of the regression that includes key HTP brands and tax increments of the mid-range MC segment are presented in Table 5. The first four estimations (M1-M4) relate HTPs and mid-range MC excise taxes in monetary units to HTP price, while the last estimation relates mid-range MC-HTP excise tax gaps in monetary units to mid-range MC-HTP price gaps. Estimations of the association between HTP and premium MC brands are skipped since they are very similar to the estimates of associations between HTPs and mid-range MCs. All specifications are estimated in the first differences to avoid non-stationarity issues, which are very likely in estimations applied to the price and tax variables expressed in monetary units. In the second round, a model is estimated using the prices of all HTP brands (Table A4 in Appendix) to confirm the robustness of the estimates from the first round.

Table 5 / Model estimates – key HTP brands (Heets/Terea and Neo)

Variables	HTP price increment (RSD)				Price gap increment (RSD)
	M1	M2	M3	M4	M5
HTP tax increment (RSD)	0.2588 (0.1677)		0.0894 (0.1597)	0.0853 (0.1576)	
MC tax increment (RSD)		0.9856*** (0.1898)	0.9622*** (0.1948)	0.9623*** (0.1924)	
Tax gap increment (RSD)					0.7287*** (0.1402)
Obs. #	153	153	153	153	153
R Squared	1.7%	15.3%	15.5%	15.4%	15.4%

Note: Tax refers only to excise (VAT not included). M2-M5 estimates refer to representative MC from the mid-range market segment. Gaps are computed as a difference between MC and HTP variables of interest. M4 refers to estimates obtained by Seemingly Unrelated Regressions (SUR) approach. Standard errors in brackets. Level of significance *** for p<0.01
Source: authors' calculations

In model M1, the estimated coefficient for the HTP-specific tax increment is positive but lower than one and statistically insignificant at conventional levels. This suggests a weak and imprecise relationship between changes in HTP excise taxes and retail price increments (direct pass-through), reflecting the pricing strategies of the industry to absorb HTP tax changes. Model M2 introduces MC taxation as an explanatory variable, yielding a highly anticipated result, namely, that the coefficient on the cigarette tax increment (indirect pass-through) is large, positive and statistically significant.

Estimates in M3 and M4 come from the same model specification, but a different estimation approach is used: M3 estimates are from the single HTP price regression (as in M1 and M2), while M4 estimates come from HTP price regression within a system that also includes MC price, estimated using the Seemingly Unrelated Regressions (SUR) approach. The purpose of M3 and M4 is to test the stability and robustness of the M1 and M2 estimates (i.e. to check whether collinearity between HTP and MC

taxes are high enough to affect estimates of regression coefficients from the separate regressions). The consistency of the findings of M1 and M2 with the estimates of M3 and M4 indicates that the hypothesis of HTP price under-shifting is valid. Opposite to the case of Montenegro (Čizmović et al. 2024), where direct pass-through is estimated to be significant but lower than indirect pass-through, price under-shifting in Serbia seems to be more extreme, as the results do not indicate any direct pass-through from HTP tax to HTP price at all.

Specification M5 shifts the focus to relative pricing, modelling how tax differentials affect the price gap between HTPs and cigarettes. In Model M5, the monetary tax gap (i.e. MC excise tax minus HTP excise tax), appears as a highly significant predictor of the price gap between the two products, but the fact that the value of the regression coefficient is less than one (0.7287) confirms again that the tax gap is under-shifted to the price gap.

While estimation confirms the significance of individual coefficients in the M2-M5 specifications, the explanatory power of regression fit (measured by R Squared) is low. Following Čizmović et al. (2024), inflation and wage growth were included as control variables; however, neither proved to be statistically significant, nor did their inclusion improve the overall model fit. In contrast, the mid-range MC price regression stemming from the SUR estimates (M4) yield a 65% model fit. Therefore, although there is evidence of some indirect tax pass-through, changes in HTP prices appear to be driven more by discretionary decisions of industry management than by automatic adjustments to changes in underlying price determinants, as is typically the case in Serbia with MCs.

6. Conclusions

In this study, we examined the expansion of HTPs in Serbia, with a focus on excise tax design, pricing strategies and market outcomes. The results indicated a combination of structural weaknesses in the tax system and deliberate pricing behaviour by the tobacco industry. Together, these factors supported the rapid growth of HTPs while producing outcomes that have been detrimental from both fiscal and public health perspectives. Although the analysis was based on the situation in Serbia, the findings are relevant for low- and middle-income countries, where regulatory and fiscal systems often adapt slowly to new tobacco products.

The analysis showed that HTPs in Serbia are taxed under a more favourable excise regime than manufactured cigarettes. While the latter are taxed per pack through a mixed system of specific and ad valorem excise duties, HTPs are only taxed through a specific excise applied per kilogram of tobacco. This difference in tax design has resulted in a consistently lower excise burden per HTP pack. Even after several excise increases, the excise tax on a 20-stick HTP pack in 2024 remained less than half as big as the specific excise applied to cigarettes. This tax advantage was not reflected in proportionally lower retail prices. The price decomposition showed that the lower tax burden on HTPs was largely captured by manufacturers. Net-of-tax prices and profit margins for HTPs were substantially higher than for both medium- and premium-priced cigarettes. From the moment HTPs entered the Serbian market in 2018, the share of the net-of-tax component in the final retail price was significantly higher than that for cigarettes. Although excise rates on HTPs have increased over time, the relative price structure has not changed meaningfully. As a result, HTPs have remained one of the most profitable segments of the tobacco market.

The econometric analysis of tax pass-through provided additional evidence of strategic pricing behaviour. We did not find a statistically robust direct effect of HTP excise increases on HTP retail prices, which indicated systematic tax under-shifting. At the same time, changes in cigarette excise taxes had a strong and statistically significant indirect effect on HTP prices. This asymmetric pass-through pattern has reinforced the relative price advantage of HTPs. It also suggests that manufacturers have intentionally absorbed HTP tax increases in order to protect their market position. The gradual convergence of HTP prices with the prices of medium-priced cigarettes further supports the interpretation that HTPs have been strategically positioned as an attractive alternative for smokers in the mid-range segment, which is traditionally less profitable in the cigarette market.

Overall, our findings indicate that the existing excise framework in Serbia has allowed manufacturers to combine favourable taxation with discretionary pricing strategies. This combination has resulted in high profitability, weak price responsiveness to taxation, and increasing market shares for HTPs.

The case of Serbia also proved to be informative for low- and middle-income countries, where multinational tobacco companies have increasingly expanded their presence and where tax-administration and price-monitoring capacities are often limited. In such environments, differential excise treatment of novel tobacco products has created opportunities for tax arbitrage and strategic under-

shifting. When HTPs are taxed more lightly than cigarettes and tax increases are not fully passed on to prices, these products tend to expand rapidly without generating proportional fiscal benefits. In these types of economies, where consumers are typically more price-sensitive, relatively favourable pricing of HTPs is likely to further accelerate substitution away from cigarettes. The lack of a coordinated tax design across tobacco product categories increases the risk of revenue losses and weaker tobacco control outcomes. The Serbian experience also shows that delayed updates of minimum excise levels and insufficient transparency in excise determination have amplified these risks.

In sum, the expansion of HTPs in Serbia has been driven by a favourable tax design and strategic industry pricing behaviour. These products have become highly profitable with a growing market presence, while their tax treatment and price dynamics have raised concerns related to fiscal efficiency and the effectiveness of tobacco control policy. The case of Serbia underlines the importance of coordinated, transparent and future-oriented excise policy. Such a policy should anticipate industry responses and reduce opportunities for tax arbitrage. These lessons are especially relevant for low and middle-income countries, where timely and well-designed policy actions are necessary to prevent novel tobacco products from undermining long-term public-health and tax-revenue objectives.

7. Policy implications

› The excise treatment of HTPs should be more closely aligned with that of manufactured cigarettes. It is clear that large and persistent tax differentials across tobacco product categories have created incentives that are not consistent with effective tobacco control. Narrowing these gaps would reduce profit-driven substitution and strengthen revenue performance.

› Introducing an ad valorem component to HTP taxation would improve the robustness of the excise system. Exclusive reliance on a specific excise per kilogram of HTP tobacco has allowed manufacturers to retain high margins and to adjust product characteristics in a way that reduces their tax liability.

› Greater transparency and the regular updating of minimum excise levels are necessary. Periods in which minimum excise values were not clearly published weakened fiscal governance and policy credibility.

› Systematic monitoring of prices and market developments remains essential. Evidence of tax under-shifting and strategic pricing underscores the need for timely data on retail prices, tax incidence and product characteristics, particularly in markets where regulatory capacity is limited.

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Appendix

Table A1 / Specific excise on cigarettes, 2018-2025

Year	Amount per pack (in RSD)	Amount per pack (in EUR)
2018		
1) 1 January to 16 March 2018	67.00	0.57
2) 17 March to 30 June 2018	67.67	0.57
3) 1 July to 31 December 2018	69.19	0.58
2019		
1) 1 January to 30 June 2019	70.70	0.60
2) 1 July to 31 December 2019	72.22	0.61
2020		
1) 1 January to 30 June 2020	73.73	0.63
2) 1 July to 31 December 2020	75.25	0.64
2021		
1) 1 January to 30 June 2021	76.75	0.65
2) 1 July to 31 December 2021	78.25	0.66
2022		
1) 1 January to 30 June 2022	79.75	0.68
2) 1 July to 31 December 2022	81.25	0.69
2023		
1) 1 January to 30 June 2023	82.75	0.70
2) 1 July to 30 September 2023	84.25	0.72
3) 1 October to 31 December 2023	90.99	0.78
2024		
1) 1 January to 30 April 2024	92.61	0.79
2) 1 May to 30 June 2024	97.70	0.83
3) 1 July to 31 December 2024	99.41	0.85
2025		
1) 1 January to 30 June 2025	101.12	0.86
2) From 1 July 2025	102.83	0.88

Source: Excise Tax Law of the Republic of Serbia (2024)

Table A2 / Price structure of the representative medium-priced MC brand (PMI L&M Loft XL Blue)

	Mid-2018	Mid-2019	Mid-2020	Mid-2021	Mid-2022	Mid-2023	Mid-2024
Price (EUR)	1.86	1.95	2.21	2.38	2.56	2.73	2.99
Excise tax – specific (EUR)	0.59	0.61	0.64	0.67	0.69	0.72	0.85
Excise tax – ad valorem (EUR)	0.62	0.64	0.73	0.79	0.84	0.90	0.99
VAT (EUR)	0.31	0.33	0.37	0.40	0.43	0.45	0.50
Net-of-tax price (EUR)	0.35	0.37	0.47	0.53	0.59	0.66	0.66
Excise tax (%)	64.45	64.40	61.94	60.95	60.08	59.33	61.40
Total tax (%)	81.12	81.07	78.61	77.61	76.75	75.99	78.07

Source: authors' calculations

Table A3 / Price structure of the representative premium-priced MC brand (Marlboro Red)

	Mid-2018	Mid-2019	Mid-2020	Mid-2021	Mid-2022	Mid-2023	Mid-2024
Price (EUR)	2.80	2.89	3.15	3.32	3.49	3.67	3.93
Excise tax – specific (EUR)	0.59	0.61	0.64	0.67	0.69	0.72	0.85
Excise tax – ad valorem (EUR)	0.92	0.95	1.04	1.09	1.15	1.21	1.30
VAT (EUR)	0.47	0.48	0.52	0.55	0.58	0.61	0.65
Net-of-tax price (EUR)	0.82	0.84	0.94	1.00	1.07	1.13	1.13
Excise tax (%)	53.97	54.24	53.34	53.06	52.82	52.59	54.61
Total tax (%)	70.63	70.91	70.00	69.73	69.48	69.26	71.28

Source: authors' calculations

Table A4 / Model estimates – all HTP brands

Variables	HTP price increment (RSD)				Price gap increment (p.p.)
	M1	M2	M3	M4	M5
HTP tax increment (RSD)	0.1934 (0.1217)		0.0132 (0.1153)	0.0250 (0.1118)	
MC tax increment (RSD)		0.8890*** (0.1268)	0.8855*** (0.1305)	0.8807*** (0.1284)	
Tax gap increment (RSD)					0.7167*** (0.0978)
Obs. #	262	262	262	262	262
R Squared	1.3%	16.5%	16.5%	16.2%	17.6%

Note: Tax refers only to excise (VAT not included). M2-M5 estimates refer to representative MC from the medium market segment. Gaps are computed as a difference between MC and HTP variables of interest. M4 refers to estimates obtained using a Seemingly Unrelated Regressions (SUR) approach. Standard errors in brackets. Level of significance *** for p<0.01
Source: authors' calculations

IMPRESSUM

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