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Analysis of the Fiscal and Health Impact of Increasing Tobacco Excise Taxes in Ukraine

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Abstract

This policy note presents simulation estimates for the fiscal and health impact of raising tobacco taxes in Ukraine through the Tobacco Excise Tax Simulation Model (TETSiM). It outlines two scenarios for tax reform, which differ in terms of the scale and type of the tax increases, as well as of their application to different tobacco products. Both scenarios reveal clear fiscal and health benefits, thus providing compelling evidence for increasing tobacco taxes in Ukraine. We estimate that by 2028 the tax reform would bring in between EUR 3.69bn (UAH 157.8bn) and EUR 5.22bn (UAH 223.7bn) of additional tax revenue, boosting total tobacco tax revenue by between 39.3% and 68.9%, while preventing between 65,000 and 165,000 smoking-related deaths. The results also reveal considerable revenue gains if there were more rapid excise tax increases without any tax advantage being given to heated tobacco products.

Keywords: Excise, Taxation, Tobacco, Smoking

JEL classification: H24, I18

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Analysis of the fiscal and health impact of increasing Tobacco Excise Taxes in Ukraine

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The study is organised into five sections. The first outlines the purpose, design and effectiveness of tobacco taxes as the most (cost-)effective form of tobacco control. The second summarises the history and current state of tobacco consumption and policy in Ukraine. The third section introduces the Tobacco Excise Tax Simulation Model (TETSiM), a well-established model for simulating the fiscal and health impact of tobacco tax reform. The fourth section describes the two scenarios and presents the results of the simulation. And the fifth provides a conclusion, comparing the fiscal and health impact of the two scenarios and offering policy recommendations.

1. TOBACCO TAXES: PURPOSE, DESIGN AND EFFECTIVENESS

Tobacco taxes are among the most effective public health interventions in terms of reducing the death toll from tobacco use: worldwide, this amounts to at least 8 million premature deaths annually from lung cancer, cardiovascular disease, diabetes and other illnesses (St Claire et al., 2020). In the tobacco control policy toolkit, taxation is coupled with various non-price interventions; but tax/price policies are generally the most effective and the most cost-effective disincentive to tobacco consumption (WHO, 2017c; 2021). Manufacturers tend to pass on a considerable share of any increase in tax to consumers, and higher prices typically lead to lower tobacco consumption (Sheikh et al., 2023). Alongside the health benefits (and healthcare savings), tobacco taxes also provide major fiscal advantages in the form of increased public revenue (Paraje et al., 2024). This is a ‘win-win’ strategy for governments around the world: the taxes reduce the smoking-related spending burden and help governments meet their revenue goals.

Tobacco taxes can be applied as a specific excise tax (in local currency units per specific volume) and/or as an ad valorem tax derived from the value of a product, alongside the general value-added tax in the country. Tax rates can be universal, or they may vary according to whether they are levied on manufactured cigarettes, roll-your-own cigarettes, heated tobacco or other tobacco products. The best practice is to rely more on specific tax and to levy a uniform duty on all tobacco products.

Tobacco taxes may reduce smoking by lowering the number of (current and future) smokers and the volume of cigarettes consumed by continuing smokers. The gains tend to be largest among young people, who are generally less committed and more price-sensitive consumers; discouraging them from smoking brings the biggest long-term savings in (raw and disability-adjusted) years of life and healthcare costs (Paraje et al., 2024). To achieve the greatest health benefits, the World Health Organization (WHO) recommends regularly increasing tobacco tax – or at least adjusting it for inflation and the growth in income, in order to keep the affordability of tobacco products at least constant and preferably in decline.

2. TOBACCO CONSUMPTION AND TAXES IN UKRAINE

At 23.2%, the age-standardised share of smokers among the population of Ukraine aged 15 years or over is close to the EU average (23.6%) and is lower than in most other non-EU countries in the post-Soviet and post-Yugoslav space (WHO, 2020). In fact, both the share itself and the gap with the EU have been narrowing in recent years: thanks to Ukraine's tobacco control policies (including tobacco taxation), cigarette sales in the country have been decreasing every year since 2008 (CTFK, 2017; Euromonitor International, 2023). However, there is still a large differential in smoking prevalence by gender: there are between two and four times as many male smokers as female, according to various estimates (Euromonitor International, 2023; WHO, 2020; 2017a). However, the most recent survey also revealed an alarming increase in daily tobacco and nicotine use among women aged 18-29 – to 28.4% (KiiS, 2023). Adolescent smoking (among 13-15-year-olds) is estimated to be around 14% (WHO, 2017b). Tobacco consumption in Ukraine has been linked to 30% of male and 9% of female deaths, or about 130,000 premature deaths annually (IHME, 2017).

It is unclear how the war has affected these trends since its outbreak in 2022: adjusted for Ukraine's shrinking population, smoking prevalence may have risen slightly, due to the exodus of females (who smoke less) and perhaps also to a greater stress-induced smoking intensity both among those on the front and among the general population (Euromonitor International, 2023). A recent national survey found that 40.2% of respondents had increased their tobacco or nicotine use since the start of the war, while 42.3% claimed no change in their behaviour (WHO, MoH and KiiS, 2023).

Most smokers (48.8% of the total legal cigarette market) consume premium or mid-price manufactured cigarettes, while a little under a third (32.4%) smoke economy cigarettes. Heated tobacco products have made rapid inroads into the market, reaching a market share of 18.1% in 2023; cigarillos account for 3.3% of the market and roll-your-own cigarettes a negligible 0.1% (own calculations based on Ukrainian National Data Agency (2023) and Euromonitor International (2023)).

Since signing the WHO's Framework Convention on Tobacco Control (FCTC) in 2006, Ukraine has – to some extent – implemented all the components of the WHO's anti-smoking toolkit (MPOWER) (WHO, 2023): verbal and graphic health warnings, advertising restrictions, sales restrictions, public smoking bans and increased taxation.

As per Article 6 of FCTC (WHO, 2006), which requires signatories to adopt tax policies aimed at reducing tobacco consumption, tobacco taxes have played a central role in Ukraine's anti-smoking efforts. Currently, they comprise four tax types: value-added (20%), ad valorem excise (12%), minimum excise (41.96 Ukrainian hryvnia (UAH) per pack; only applied to manufactured cigarettes) and specific excise (ranging from UAH 27.58 per pack for roll-your-own cigarettes to UAH 31.35 per pack for mid-price and premium cigarettes) (CTFK, 2023; Dauchy and Iavorskyi, 2020). To reach their current levels, taxes have increased every year since 2008, raising the total excise revenue from UAH 2.4bn UAH in 2008 to an impressive UAH 64.6bn in 2023, despite a concurrent decline in sales (CTFK, 2017).

At the time of writing, no tax increase has been announced beyond 2025. However, several tax proposals have emerged recently. In this report, we analyse and simulate two proposals, as detailed in the empirical section below. The main differences between the proposals relate to the graduality (or lack thereof) and the scale of the proposed increases, as well as to the treatment of heated tobacco products (HTPs), as opposed to traditional cigarettes (uniform or differential tax rates).

Cumulatively, Ukrainian tobacco taxes amount to about 66.7% of the weighted average price of cigarettes in the country (Dauchy and Iavorskyi, 2020). While this is an all-time high for the country – and substantially exceeds the global average of 52.4% – it remains (slightly) below both the European average of 69.6% and the recommended minimum of 75%. Crucially, cigarettes in Ukraine remain fairly cheap (at a weighted average price of EUR 2 or UAH 84.50 per pack) and affordable – even after accounting for purchasing power, cheaper than in most (or, according to some estimates, all) EU countries (Euromonitor International, 2023; own calculations).

3. DESCRIPTION OF THE TETSIM MODEL

The Tobacco Excise Tax Simulation Model (TETSiM) is used to estimate the impact of tobacco tax increases. The baseline variables in TETSiM describe the cigarette market, as well as the macroeconomic situation in the country concerned. Market variables include the volume sold (i.e. the size of the market); market segment; and decomposition of the retail price into tax components (excise, minimum excise tax (MET), VAT) and net-of-tax components (costs, retail margin, profit). The market in our model comprises of four segments: roll-your-own (RYO) tobacco, cigarettes and cigarillos in the economy price segment, mid-price and premium cigarette and cigarillo brands combined, and heated tobacco products (HTPs). The macro-level variables include the size of the adult population, adult smoking prevalence, inflation and GDP growth.

The policy transmission mechanism rests on: 1) the deterministic relationship between price/income changes and the demand for cigarettes; and 2) the response of the industry to the tax increase.

The elasticities' coefficients are calibrated using estimates from the empirical literature on this topic. Where possible, we check the calibrated coefficients with estimates for the Ukrainian economy. Most estimates of **cigarette price elasticities** in high-income countries range from -0.2 to -0.6, clustering around -0.4, with the lowest socioeconomic groups the most responsive to price changes, and mid- and premium-brand smokers the least responsive (US NCI and WHO, 2016). Ross et al. (2012) estimate similar average price elasticity for Ukraine (-0.32). The estimates by Fuchs and Meneses (2017) of average tobacco price elasticity in Ukraine are somewhat higher (-0.45). The study confirms that poorer consumers have a higher price elasticity than higher-income consumers. In line with all this empirical evidence, the model's coefficients are calibrated to -0.4 for the price elasticity of economy brands, and to -0.2 for the price elasticity of mid- and premium brands. The most recent literature on **HTPs** found generally higher price elasticity than for cigarettes, and we apply the estimate of -0.98 suggested by Qian (2024). The **income elasticity of demand** is usually country specific. In the absence of evidence from Ukraine, we used the standard practice in tax modelling and set income elasticity at 0.2 (Ross and John, 2023; Tesche et al., 2023).

As a result of any tax/price increase, we assume a **substitution** from premium and mid-price cigarettes toward the economy price segment, and from economy brands to RYO tobacco. HTPs are priced at least as high as premium cigarettes, and we assume that any switch to HTPs is driven mainly by factors other than price. The cross-price elasticities are based on the literature (Tauras et al., 2006) and the standard practice in tax modelling (Tesche et al., 2023).

The response of the tobacco industry to any tax increase is assessed in terms of **tax passthrough** to the retail price. The industry may respond by overshifting (increasing the retail price by above the tax increase), undershifting (absorbing some of the increase) or undertaking a perfect passthrough of the tax increase to the consumer. We assume perfect passthrough for the RYO, economy brand and HTP price segment, whereas in the mid- and premium price segment 5% overshifting is assumed. Modelled in this way, the industry – motivated as it is by profit – would want to compensate for lost market volume, while still providing cheap smoking options in order to preserve its customer base.

The demand for tobacco products changes when a tax increase impacts the retail price of those products. The model estimates the price change (using the above assumptions about the industry price strategy) and the demand change (based on the price and income elasticities of demand).

The lower demand is then translated into **health outcomes** using both empirical studies and epidemiologically established links. Specifically, it is assumed that the decline in consumption translates to both lower prevalence (half of the demand change) and lower smoking intensity (the other half). This is based on empirical studies showing that roughly 50% of the decline in demand is due to smokers quitting (Goodchild et al., 2016). The lower prevalence reduces the number of smokers, and among those who no longer consume tobacco the likelihood of dying of tobacco-related disease is reduced by at least 30%. Thus, the number of premature deaths averted is estimated by multiplying the difference in the baseline number of smokers and the number of smokers after the intervention by a factor of 0.3.

The model's coefficients and assumptions are summarised in Table 1.

Table 1 / Model's coefficients and assumptions

Elasticity coefficients

	RYO	Economy brands	Mid- & premium brands	HTP	Literature estimates used in modelling, for cigarettes
Income elasticity of demand	0.2	0.2	0.2	0.2	0.1-0.55
Price elasticity of demand	-0.5	-0.4	-0.2	-0.98	(-0.2)-(-0.6)
Cross-price elasticity of demand (relative to higher price product in same grouping)	0.3	0.3			0.01-0.62

Tax passthrough

	RYO	Economy brands	Mid & premium brands	HTP	
	Perfect passthrough	Perfect passthrough	Overshifting (5%)	Perfect passthrough	

Health parameters

Percentage of the decrease in consumption due to lower smoking prevalence – quitting	50%		
Percentage of people saved from premature death by quitting/not starting	30%		

Sources: Price and income elasticities are based on the literature and follow the standard practice in tax modelling: Qian (2024), Ross and John (2024), Tauras et al. (2006), Tesche et al. (2023), US NCI and WHO (2016). Health parameters are based on Goodchild et al. (2016).

Note that only tax changes are modelled; other tobacco control policies are held constant. This is justifiable, since the models only predict short-run market results. Another **limitation** of the model is that it does not capture the impact of tax changes on cross-border shopping or tax evasion. Empirical evidence shows that tax evasion in tobacco markets occurs in both low- and high-tax jurisdictions (albeit at different rates) and that tax increases do not necessarily translate into higher illicit rates (Joosens and Raw, 2003; Ajmal and U, 2015; Ross and Blecher, 2019). The model thus implicitly assumes that there is no substantial shift from legal to illegal cigarettes. Also, the model makes predictions for a single cohort, and thus does not consider the dynamic aspects of changing demographics (apart from population growth) and secular trends in smoking prevalence. However, a study comparing a single cohort analysis with the results of a dynamic model found no substantial difference in the main findings (Levy et al., 2013). Despite these limitations, TETSiM has been used in many countries to help ministries of finance and other stakeholders plan and advocate for tobacco tax policies at least over the short to medium term.

Further detail about the model is provided elsewhere (US NCI and WHO, 2016; van Walbeek, 2010; Goodchild et al., 2016; van der Zee and van Walbeek, 2020).

4. SCENARIO SIMULATION

Scenario description

We model two scenarios.

Scenario 1 follows the initial version of the Ukrainian Ministry of Finance's (MF) proposed reform from March 2024. The MF schedule plans a gradual rise in excise taxes to 2028, when a minimum excise tax rate of EUR 90 per 1,000 cigarettes will be reached. This change is in line with the European Commission's Directive 2011/64/EU. Under that Directive, overall excise duty must be at least EUR 90 per 1,000 sticks and should represent at least 60% of the weighted average retail selling price (the latter condition is already met in Ukraine) (Article 10(2)).[1] However, Scenario 1 treats manufactured cigarettes (MC) and HTPs differently, giving HTPs a tax advantage, with a minimum excise tax rate of EUR 72 per 1,000 HTP sticks.

Scenario 2 evaluates the effects of an alternative proposal submitted to the Ukrainian Parliament in April 2024. This scenario assumes a more rapid rise in excise taxes (both the minimum and the specific). The minimum excise tax rate would reach EUR 120 per 1,000 sticks for both cigarettes and HTPs by 2028. Thus, a uniform tax rate is planned for both cigarettes and HTPs.

The proposed excise rates under both scenarios are shown in Table 2.

[1] The European Commission is currently revising the Directive to include new products and update the minimum excise. https://ec.europa.eu/health/tobacco/products/revision_en

Table 2 / Tobacco excise taxes used in the scenarios

	Minimum excise on cigarettes			
	UAH per 1000 cigarettes		EUR per 1000 cigarettes	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
2023	2,097	2,097	53	53
2024	2,617	2,617	61	61
2025	3,502	3,502	78	78
2026	4,010	4,499	82	92
2027	4,336	5,345	86	106
2028	4,563	6,084	90	120
	Specific excise on cigarettes			
	UAH per 1000 cigarettes		EUR per 1000 cigarettes	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
2023	1,568	1,568	39	39
2024	1,947	1,947	45	45
2025	2,604	2,604	58	58
2026	2,983	3,325	61	68
2027	3,227	3,933	64	78
2028	3,397	4,462	67	88
	Specific excise on HTPs			
	UAH per 1000 cigarettes		EUR per 1000 cigarettes	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
2023	2,097	2,097	53	53
2024	2,617	2,617	61	61
2025	3,161	3,502	70.4	78
2026	3,462	4,499	70.8	92
2027	3,587	5,345	71.1	106
2028	3,650	6,084	72	120
	Specific excise on RYO			
	UAH per kg		EUR per kg	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
2023	1,970	1,970	50	50
2024	2,466	2,466	58	58
2025	3,278	3,278	73	73
2026	3,765	4,205	77	86
2027	4,084	4,992	81	99
2028	4,310	5,678	85	112

Sources: Draft Law "On Amendments to the Tax Code of Ukraine Regarding the Revision of Excise Tax Rates on Tobacco Products". No. 11090 registered on 18.03.2024, and No. 11090-3 registered on 03.04.2024. The exchange rate forecast is from Focus Economics.

The model uses data from different sources. The market volumes of MCs and HTPs for 2023 are taken from the Ukrainian tax service; the price of MCs for 2023 is from the Ukrainian Statistical Office; the price of HTPs is from the database of the Campaign for Tobacco-Free Kids; the market shares of all tobacco products are based on the market volumes and Euromonitor Passport; inflation and GDP forecasts are from the World Bank; the exchange rate forecast is from Focus Economics; population size is from the International Monetary Fund's World Economic Outlook database; and smoking prevalence data are from the WHO. Given the uncertainty of the current population projections for Ukraine, we assume no change in population size over the modelling period.

Simulation results

Here we present the results of the model simulations. We first outline the impact of tax increases on government revenue and on consumption, and then continue with the likely health impact. The findings from both scenarios are included in the summary table (Table 3) at the end of the section.

Figure 1 and Figure 2 present total tax revenue from tobacco and excise tax revenue from tobacco according to the two scenarios. As excise tax increases, tax revenue rises in both scenarios. By 2028, Scenario 1 sees a cumulative increase of 39.3% and 42.1% in the annual total and excise tax revenue from tobacco. As the tax increases slow in later years, the tax revenue begins to stagnate. Note that the HTP tax advantage in Scenario 1 may motivate some current cigarette users to switch (or double use), which would result in lower tax revenue than our model predicts. Scenario 2 has higher tax increases and higher revenues: in 2028, total and excise tax revenue from tobacco is, respectively, 68.9% and 75.3% higher in real terms than in 2023. The weighted average price of cigarettes increases according to both scenarios, with higher prices in Scenario 2.

Figure 1 / Total tax revenue (UAH m, real values)

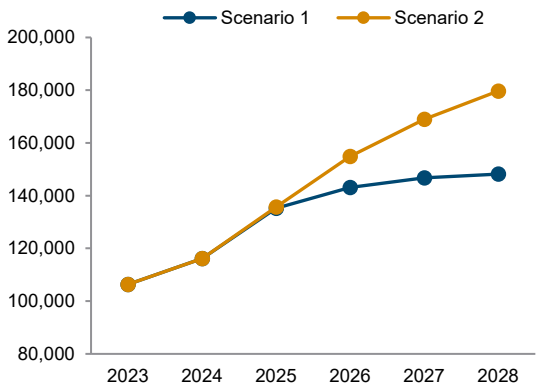
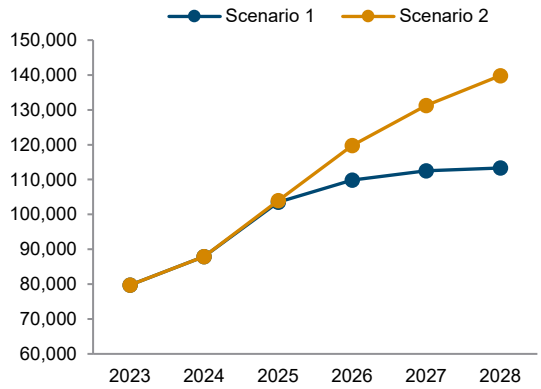
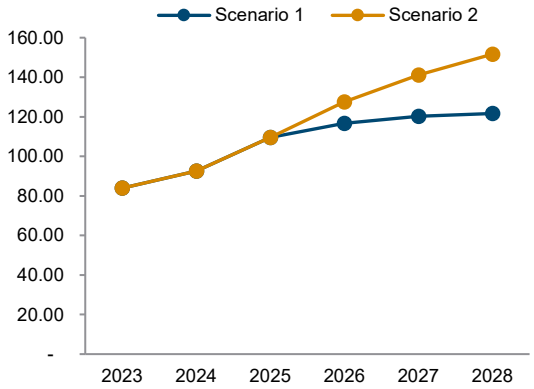


Figure 2 / Excise tax revenue (UAH m, real values)



Source: Own calculations, based on the data described in Section 4 (page 14).

Figure 3 / Weighted average price (WAP) for a pack of cigarettes (UAH, real values)



Source: Own calculations, based on the data described in Section 4 (page 14).

As shown in Figure 4 and Figure 5, tobacco consumption and smoking prevalence will decline up until 2026 in both scenarios. However, there is a divergence after 2026, as tobacco consumption and smoking prevalence remain more or less constant in Scenario 1, while in Scenario 2 they continue to decline until the end of the forecast period.

Figure 4 / Tobacco products per smoker (sticks per year)

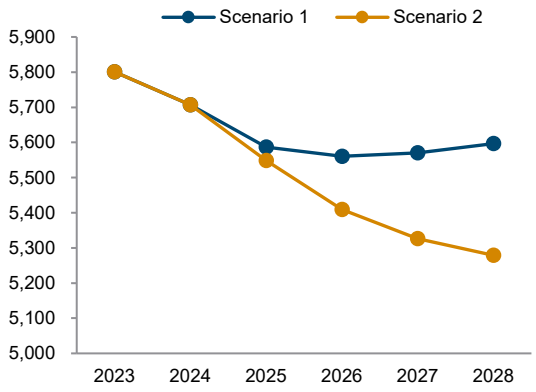
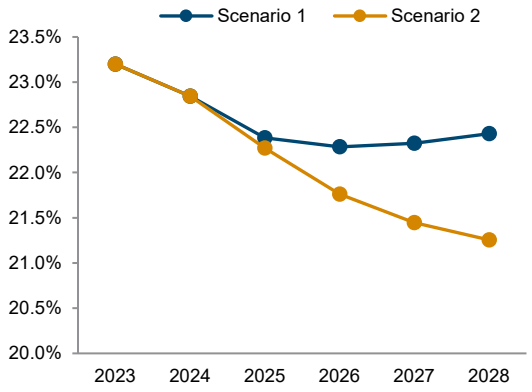


Figure 5 / Smoking prevalence



Source: Own calculations, based on the data described in Section 4 (page 14).

The estimated effects on health are presented in Figure 6 and Figure 7. Figure 6 shows the number of people still smoking after the intervention, while Figure 7 shows the cumulative number of premature deaths averted due to the proposed tax changes. In line with the results for smoking prevalence, the health indicators perform better under Scenario 2: the number of smokers declines by 8.4% over the five-year period, whereas in Scenario 1 the cumulative decline is only 3.3%. Moreover, in Scenario 1 the model predicts a rise in the number of people smoking from 2026, indicating that the proposed changes may not be adequate to preserve the public health gains. Scenario 2 is expected to avert 99,553 more premature deaths than Scenario 1.

Figure 6 / Number of people smoking

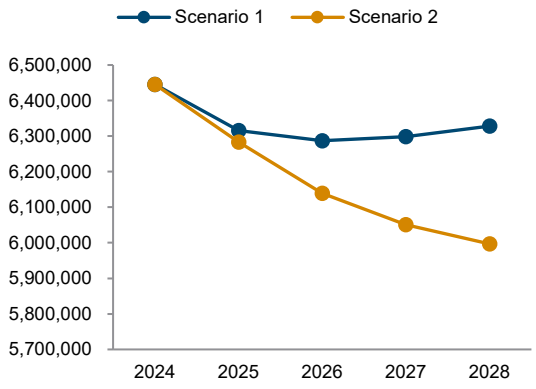
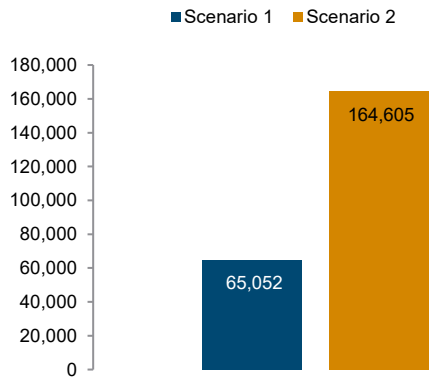


Figure 7 / Five-year cumulative number of premature deaths averted



Source: Own calculations, based on the data described in Section 4 (page 14).

Table 3 / Summary table

Scenario 1

Year	Total tax revenue		Total excise revenue		Weighted average price (manufactured cigarettes, pack)	Weighted average price (all tobacco products, pack)	Per capita consumption of tobacco products		Smoking prevalence	Number of smokers	
	UAH million, inflation adjusted	cumulative change, %	UAH million, inflation adjusted	cumulative change, %	UAH, inflation adjusted	UAH, inflation adjusted	sticks per year	cumulative change, %	%	people	cumulative change, %
2023	106,364		79,757		84	84	1,346		23.2%	6,545,462	
2024	116,208	9.3	87,872	10.2	93	92	1,304	-3.1	22.8%	6,445,414	-1.5
2025	135,249	27.2	103,511	29.8	110	108	1,251	-7.1	22.4%	6,315,740	-3.5
2026	143,178	34.6	109,832	37.7	117	114	1,239	-7.9	22.3%	6,287,079	-3.9
2027	146,815	38.0	112,540	41.1	120	117	1,243	-7.6	22.3%	6,298,286	-3.8
2028	148,182	39.3	113,321	42.1	122	118	1,255	-6.7	22.4%	6,328,622	-3.3

Scenario 2

Year	Total tax revenue		Total excise revenue		Weighted average price (manufactured cigarettes, pack)	Weighted average price (all tobacco products, pack)	Per capita consumption of tobacco products		Smoking prevalence	Number of smokers	
	UAH million, inflation adjusted	cumulative change, %	UAH million, inflation adjusted	cumulative change, %	UAH, inflation adjusted	UAH, inflation adjusted	sticks per year	cumulative change, %	%	people	cumulative change, %
2023	106,364		79,757		84	84	1,346		23.2%	6,545,462	
2024	116,208	9.3	87,872	10.2	93	92	1,304	-3.1	22.8%	6,445,414	-1.5
2025	135,719	27.6	103,973	30.4	110	109	1,236	-8.2	22.3%	6,283,492	-4.0
2026	154,932	45.7	119,764	50.2	128	127	1,177	-12.5	21.8%	6,138,959	-6.2
2027	169,031	58.9	131,241	64.6	141	141	1,142	-15.1	21.4%	6,050,623	-7.6
2028	179,691	68.9	139,814	75.3	152	151	1,122	-16.6	21.3%	5,996,780	-8.4

Source: Own calculations, based on the data described in Section 4 (page 14).

5. CONCLUSION

This simulation provides compelling evidence in favour of raising tobacco taxes in Ukraine. Both scenarios would improve public health and increase tobacco-related tax revenue: between 65,000 and almost 165,000 premature deaths would be prevented; while between EUR 3.69bn (UAH 157.8bn) and EUR 5.22bn (UAH 223.7bn) of additional tax revenue would be collected by 2028.

But clearly Scenario 2, which assumes higher taxes, is better for both public health and tax revenue. Scenario 1 is also less good because it proposes creating a tax gap between cigarettes and HTPs. Besides the lost revenue due to lower taxes, the HTP tax advantage in Scenario 1 could promote substitution, rather than quitting. (Though the possibility is not modelled on account of a lack of empirical evidence, such a development would result in even lower tax revenue than our model predicts.) The

models demonstrate that the benefits could be maximised if tax increases are enacted swiftly and uniformly across all tobacco products.

It is a limitation of both the proposed reforms that neither considers the broader macroeconomic environment. Inflation and income growth have the potential to increase the affordability of tobacco products, which could in turn undermine the preventive impact of tobacco taxes (WHO, 2021). This is already evident in Europe (and elsewhere), where a surge in inflation in recent years has reduced the value of specific taxes. The solution is not to rely on ad valorem tax, but rather to initiate an automatic indexation of the specific tax to inflation and income growth. Such an approach, in combination with periodic tax rises, would reduce both the affordability of tobacco products and their consumption. This idea is already embedded in the proposed revision to the EU Tobacco Tax Directive, which relies on periodic updates for inflation (every three years).

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