Journal of Business and Econometrics Studies

Tax Design Matters: The Impact of Cigarette Excise Tax Structure in Shaping Government Revenues in the EU

Natalia Kornienko

Independent researcher ex- Head of Tax Policy Development Department, Gaidar Institute for Economic Policy, Germany, EU

Corresponding author
Natalia Kornienko, Independent researcher ex- Head of Tax Policy Development Department, Gaidar Institute for Economic Policy. Germany, EU.

ABSTRACT

The reform of the EU Tobacco Tax Directive offers an opportunity to reassess tobacco taxation's role in raising stable and predictable revenues. This paper analyses how specific versus ad valorem excise tax structures affect tobacco tax revenues across 27 EU countries from 2010 to 2024 using fixed-effects panel regression. In the analysis two hypotheses are tested: first, whether systems with a high reliance on specific excise taxation generate higher per capita tobacco tax revenues; and second, whether the revenue impact of such systems depends on regular adjustments to the specific tax component, such as indexation.

The results show that countries with a high share of specific excise taxes consistently collect more tobacco tax revenue per capita than those relying more on ad valorem taxation. The regression results suggest that the EU could potentially collect an additional €4 billion in revenue. However, this estimate should be interpreted with caution, as other unobserved factors may influence revenue outcomes. This increase is associated with a higher reliance on the specific component within the overall tax structure, even without raising tax rates, although other factors may also contribute. However, the analysis also reveals that, in the absence of indexation, increases in the specific share are associated with declines in revenue, likely reflecting erosion in real tax levels over time. By contrast, when specific taxes are regularly indexed, each additional percentage point in the specific share is associated with a positive and statistically significant change in revenue.

Based on this evidence, two key policy recommendations emerge:
- EU member states may wish to consider prioritising specific excise taxes over ad valorem components to enhance fiscal returns, while considering national circumstances and administrative capacity.
- Specific tax systems should incorporate adjustment mechanisms to safeguard revenues against inflation and market shifts.

Introduction

A country's tax system is crucial for government revenue and long-term sustainability [1,2]. Globally, governments aim to design tax frameworks that generate sufficient revenue while promoting efficiency, equity, and sometimes public health. The mix of taxes, such as corporate, VAT, excise and their internal structures directly influence both revenue levels and stability. Within a tax instrument, the structure (i.e., the balance between specific and ad valorem components) also affects both the level and volatility of revenues. The design of an excise tax system for tobacco products should aim to balance fiscal and health objectives: ensuring adequate revenues while reducing tobacco consumption and related health risks. In the EU, excise taxation serves as a key instrument of both fiscal and public health policy.

Over the past decades, the EU has engaged in an active debate on the merits of shifting towards a fully specific excise system. Both theoretical and empirical evidence suggest that specific taxation delivers more predictable fiscal revenues, reduces opportunities for tax avoidance by manufacturers, and strengthens market transparency. At the same time, its effectiveness depends heavily on robust administration and enforcement. Without strict tax discipline, the shift toward specific taxation may increase incentives for illicit trade and undermine the revenue base. This raises an important policy question: can the adoption of a fully specific excise, combined with effective enforcement, deliver sustainable positive outcomes for EU Member States, both in terms of fiscal revenues and public health gains?

Theoretical and empirical work converge on this point. Keen and subsequent studies show that only under strict enforcement and effective administration can specific excises deliver their intended potential, reducing opportunities for tax evasion and securing both higher fiscal revenues and lower consumption [3]. Recent empirical evidence reinforces this conclusion. Primorac et al. find that while both tax types contribute to revenue, specific excise taxes yield more stable and predictable fiscal streams, largely by limiting consumer down trading to cheaper brands [4]. By contrast, ad valorem taxes remain more vulnerable to market price shifts and consumer substitution. These findings are directly relevant for policymakers seeking to balance fiscal stability with broader societal goals, including the reduction of harmful consumption.

Despite a longstanding debate in the public finance literature regarding optimal tax structure, empirical evidence on the direct relation between tax structure and government revenue remains limited. Accordingly, this study seeks to contribute to the literature by examining the effects of different excise tax types, most notably specific and ad valorem excise taxes, on government revenues across the EU.

This paper analyses panel data from 27 EU countries over 15 years to compare revenue outcomes of specific versus ad valorem tobacco excise taxes. Using fixed-effects regression to account for country and year differences, the study finds that greater use of specific excise taxes, especially when indexed to inflation, correlates with stronger and more stable per capita tobacco tax revenues. The results provide robust evidence of fiscal benefits from excise tax reform, beyond prior theoretical or case study approaches. The analysis is limited to the European customs union, and its regulatory environment differs substantially from non-union countries like Australia, New Zealand, and Canada, which have more policy flexibility due to the absence of harmonized excise directives.

Literature Review
Research shows that excise tax structures significantly influence consumer behavior, especially with cigarette taxation. Effective tax designs can change consumption patterns, support public health, and improve revenue generation. Moving from a mixed to a uniform specific excise is part of the broader issue of optimal taxation, as outlined by Ramsey, which aims to minimize deadweight loss and maintain revenue. The analysis is further complicated by market conditions; the tobacco industry can be modeled as an oligopoly, monopolistic competition, or differentiated-product oligopoly depending on regulatory emphasis, consumer preferences, or competitive dynamics.

The EU tobacco sector is highly concentrated. Therefore, early theoretical contributions treated the EU tobacco sector as an oligopolistic industry. Delipalla and Keen argued that under imperfect competition ad valorem taxation could lower prices and profits while enhancing overall welfare. Similarly, Myles found that a mix of both instruments could maximize revenues, with the ad valorem component reducing firms' market power and bringing outcomes closer to perfect competition [5,6]. Taken together, these early models suggested that raising the ad valorem share while minimizing the specific component might align with fiscal and health objectives. However, such analyses did not account for the role of illicit trade, a critical omission in later debates.

Subsequent research incorporated the role of the illegal tobacco market and found that ad valorem increases provide stronger incentives for illicit trade than specific increases. Delipalla , in examining tax harmonization in the EU, demonstrated three core results clarifying how tax systems need to be adjusted to reduce the market share of illicit products [7]. Crucially, shifting the balance toward specific taxation reduces incentives for illegal trade while safeguarding fiscal revenues.

Other studies have shown that under conditions of cost uncertainty (for instance, input price volatility), ad valorem excises amplify fluctuations in output and prices, whereas specific taxes deliver greater predictability in revenue collection [8]. Goerke and Delipalla and O'Donnell further demonstrated that, under imperfect competition, specific excises are more effective in limiting the affordability of cheap cigarettes, thereby raising retail prices, and reducing consumption, an outcome of central importance for public health [9-11].

These findings are consistent with WHO FCTC recommendations and Laffer, which advocate for excise structures that discourage consumers from switching to cheaper brands following tax increases [12]. While a uniform specific tax cannot entirely prevent down-trading, it ensures that tax revenues remain stable because each unit is taxed equally, regardless of price. Laffer also notes that specific taxes limit substitution, safeguard the tax base, and secure revenue independently of pricing strategies. Achieving the right balance between ad valorem and specific excises is thus a nuanced policy challenge, aiming to promote public health and curb illicit trade.

More recent studies, such as Primorac and Jeric, confirm that higher specific taxation leads to a statistically significant reduction in cigarette consumption, whereas ad valorem increases do not [13]. Moreover, specific tax increases raise excise revenues, while ad valorem rates have no significant effect. In practice, ad valorem components are increasingly used to protect domestic producers rather than to achieve fiscal or health objectives. A study conducted by Primorac et al. analyses the effects of excise tax structures on cigarette pricing across EU member states, with particular emphasis on the pass-through rate of ad-valorem and specific taxes to consumers [4]. Similarly, Chaloupka et al. provides an extensive analysis across 21 EU member states between 1998 and 2007, showing that reliance on ad-valorem taxes widens price gaps and increases volatility of revenues [14].

International financial institutions like the IMF and World Bank increasingly support tobacco tax reform to strengthen public health and boost domestic revenue. Their recommendations centre on three main principles:
- Prioritising specific excise taxes over ad valorem taxes, as the former are more effective at reducing consumption, generating stable revenues, and discouraging consumers from switching to cheaper brands;
- Simplifying tax regimes by reducing tiers, which increases administrative efficiency and curbs avoidance; and
- Implementing gradual, inflation-indexed tax increases to preserve the real value of revenues (WHO, 2010).

These guidelines are grounded in empirical and policy evidence, collectively advocating for specific-heavy tax systems as more robust both fiscally and in achieving public health goals.

Institutional Context and European Experience
Excise Tax Structure

The design of tobacco excise taxation varies substantially across countries, reflecting differing policy objectives and institutional legacies. Broadly, three approaches to tobacco taxation can be identified in the global landscape. Some countries employ a purely specific excise system, where taxes are levied as a fixed amount per unit (e.g., Indonesia). Others utilize a purely ad valorem system, taxing tobacco as a proportion of its value (e.g., Saudi Arabia). A third group adopts a mixed system, combining both specific and ad valorem components; this approach is employed in EU countries.

The relative importance of each component in mixed systems is not uniform. For instance, Denmark applies a high specific excise rate and a nominal 1% ad valorem rate on cigarettes, resulting in the specific component accounting for most of the tax revenue. Figure 1 presents a global overview, classifying countries by predominant source of cigarette excise tax revenue. For countries with a mixed system, classification is based on the share of each tax type in the weighted average price (WAP) of cigarettes; the larger share determines the country's allocation. In the figure, grey denotes a greater reliance on specific excises, while dashed colour indicates predominance of ad valorem taxes.
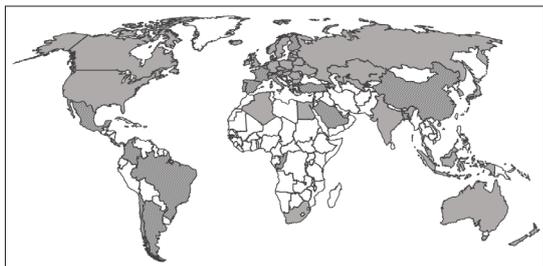

Figure 1: Map Indicating the Predominant Source of Cigarette Tax Revenue: Specific Excise (grey) vs. ad Valorem (dashed)

Notes: This figure illustrates countries with greater reliance on specific taxes (grey) vs. ad valorem taxes for excise taxes of cigarettes.

The evolution of the specific excise share in total tobacco excise taxation within the EU has been similarly diverse. Figure 2 depicts shares of specific or ad valorem tax components within EU member states on overall excises on cigarettes, ranging from a specific share as low as 14.0% in Luxembourg, to an almost fully specific tax system of 98.5% in Denmark.

Tobacco excises in the EU countries are regulated by the provisions of the Directive on excise duties for manufactured tobacco (Council Directive 2011/64/EU), which mandates that cigarettes be subject to a mixed excise tax structure including a specific component of expressed as a fixed amount per 1,000 cigarettes, and an ad valorem component - expressed as a percentage of the maximum retail selling price.
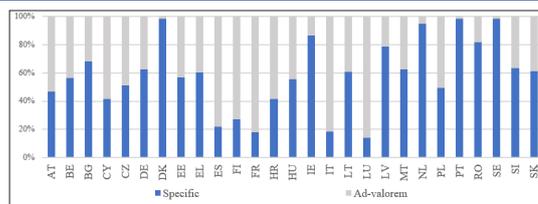
Figure 2: Structure of the Excise Taxes on Cigarettes in EU Countries in 2025

Notes: Source: European Commission (2025).

Illicit Trade

Illicit cigarette trade in the EU is sensitive to tax rate changes and enforcement. Rapid excise increases often lead to more illicit activity, particularly in border areas with large price gaps. The shadow market is supply-driven, operating via legal, counterfeit, and smuggling channels, and benefits from tax evasion and less regulation. According to World Bank, illicit trade reduces average retail prices by about 4% and increases overall consumption by 2%, though the true market size remains uncertain due to displacement and risk premiums [15].

International evidence (WHO, WCO, IMF, World Bank, ITIC) shows that legitimate products are often used to mask illicit flows, making exclusive reliance on unregulated sources rare. The effectiveness of enforcement and control mechanisms is therefore crucial. According to the IMF, illegal trade occurs via smuggling, counterfeit stamps, and illicit production, causing revenue losses and undermining tax policy and public health [16]. Addressing this requires comprehensive strategies: stronger border controls, modern detection technologies, capacity-building, and international cooperation.

A key element is robust tracking and tracing systems, with unique identifiers enabling authorities to monitor products from manufacture to sale. The EU has advanced such systems, aligning with international standards, and ensuring independence from the tobacco industry [17].

Despite a long-term decline in aggregate cigarette consumption (from 660 billion units in 2007 to 424 billion in 2024), illicit and non-domestic legal consumption remain significant, 9.2% and 6.2% of total consumption, respectively, in 2024 (see Figures 3 and 4). Illicit consumption fell from 9.8% to 7.2% between 2010 and 2019, then rose again post-pandemic. Increases in ad valorem taxes tend to widen price gaps and incentivise illicit trade, while specific taxes compress price differentials and reduce illicit profit margins. Regular indexation of specific rates, combined with strong enforcement, is essential for improving public health and revenue outcomes across the EU.
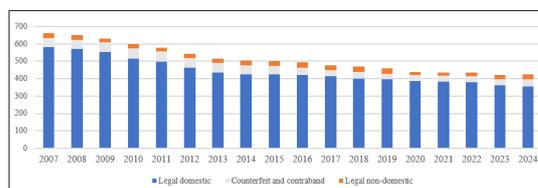
Figure 3: Total Manufactured Cigarette Consumption in EU27 Countries from 2015 to 2025 (bn. cigarettes).

Source: KPMG (2013-2025). Illicit Cigarette Consumption in Europe.

Note: Legal non-domestic refers to a product that is brought into the market legally by consumers, such as during cross-border trip.
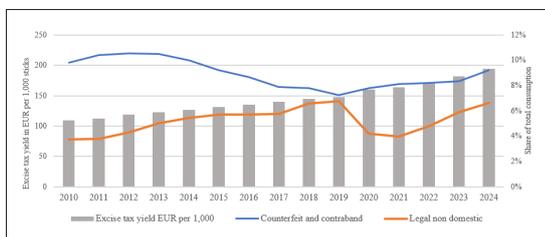

Figure 4: Average Excise Tax Yield Per 1,000 Cigarettes and Illicit Cigarette Consumption in EU27 Countries from 2015 to 2025.

Source: KPMG (2013-2025). Illicit Cigarette Consumption in Europe, European Commission (2015, 2025).

Country-Level Illustrations: Austria and the Czech Republic
This subsection examines two country cases. Austria represents a case of increasing reliance on specific taxes alongside rising revenues, while the Czech Republic illustrates the opposite trajectory.

Austria has shifted from mainly ad valorem to a greater emphasis on specific excise taxes for cigarettes. From 2010 to 2025, the specific excise rate increased from EUR 26.69 to EUR 83.5 per 1,000 cigarettes, while the ad valorem rate dropped from 43% to 32% of retail price. The proportion of specific tax in overall cigarette taxation rose from 18.28% to 36.3%. During this time, cigarette tax revenue grew from EUR 1.5 billion to EUR 2.1 billion, driven by higher specific rates and retail prices.
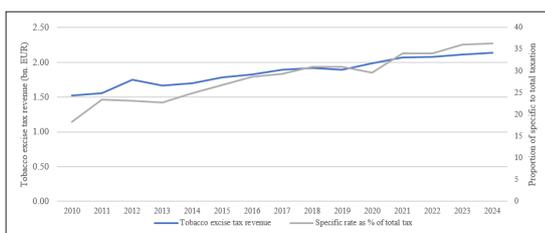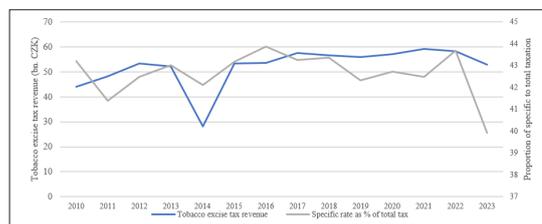

Figure 5: Tobacco Excise Tax Revenues and Proportion of Specific Excise as a Percentage of Total Taxation in Austria 2010 to 2024.

Source: European Commission (2025) Excise duty tables on tobacco.

The Czech Republic has prioritized specific cigarette taxes, raising the excise rate from EUR 42.09 per 1,000 cigarettes in 2010 to EUR 90.2 in 2025. The ad valorem rate increased from 28% to 30%, but the specific share dropped from 42.5% in 2021 to 39.9% in 2023. As a result, total tobacco excise revenue fell from CZK 59 billion to CZK 52 billion, reflecting the link between reduced specific tax emphasis and declining revenue.

Taken together, the experiences of Austria and the Czech Republic illustrate the broader pattern emerging from the panel analysis. Strengthening the specific share, especially when combined with regular adjustment mechanisms can contribute to higher and more stable government revenue from tobacco taxation. Conversely, erosion of the specific share may undermine revenue outcomes even in systems that initially relied heavily on specific taxes.

Figure 6: Tobacco Excise Tax Revenues and Proportion of Specific Excise as a Percentage of Total Taxation in the Czech Republic 2010 to 2023.

Source: European Commission (2025) Excise duty tables on tobacco.

Methodology
To complete the initial observations about the positive correlation between tobacco excise tax revenue and the proportion of specific excise taxes to total taxation in Austria and the Czech Republic, we turn towards regression analysis.

This section describes the identification strategy to estimate the impact of cigarette excise tax structure on government revenues. By analysing the evolution of excise tax revenues in EU countries over time, it aims to identify whether excise tax structure has a significant impact on governments' ability to raise revenues, considering market size, prices, and tax levels, and controlling for other differences between countries that may affect revenue levels and evolution over time.

Using EU countries allows to build a panel of complete and comparable market data for 27 countries over 10 years, including tax revenues, sales volumes, prices, and excise tax structure.

Variables
The variable of interest is the revenue from cigarette excise taxes. To make cigarette excise tax revenues comparable across countries of different size, we calculate cigarette tax revenues per capita by dividing total annual cigarette tax revenues with the population size of the respective year. The resulting annual tax revenues per capita are used as the dependent variable.

Regarding independent variables we are mostly interested in ad valorem and specific tax rates. However, as we are not interested in the effect of the level of taxes, but the composition of taxes on tax revenues, we transform the specific tax rates to a specific ratio. The specific ratio is the share of the specific component on the total excise tax at the weighted average price (WAP):

$$specific\ ratio = \frac{specific\ tax\ rate}{total\ excise\ tax\ at\ WAP}$$

$$= \frac{specific\ tax\ rate}{specific\ tax\ rate + ad\ valorem\ tax\ rate * WAP}$$

To capture the other factors that may affect the tax revenues as well as the tax structure, we additionally add the share of the illicit market and inflation to the regression as control variables.

Specification
We estimate two specifications in a two-way fixed-effects framework (country- and year-fixed effects), controlling for inflation and the illicit market share. The dependent variable, Rev_{it}, is government cigarette excise tax revenue per capita in country i in year t. Our policy variable is the specific ratio S_it. Specification 1 tests for a threshold (high-specific) regime using a dummy variable $D_{it}^{high} = 1[SR_{it} \geq 0.70]$. Specification 2 uses a continuous ratio and interacts it with a country-level indicator R_it that equals 1 when the specific component regularly increases (e.g., due to indexation or stable legislative updating). We rely on a two-way fixed effects panel OLS model, which appropriately controls for unobserved country- and time-specific heterogeneity. While dynamic estimators such as System GMM could, in principle, address potential endogeneity, our dataset does not provide the necessary conditions for their valid application, given the limited time dimension and the high risk of instrument proliferation.

$$Rev_{it} = \beta_1 D_{it}^{high} + \ddot{a}^T X_{it} + \mu_i + \tau_t + \dot{o}_{it} \tag{1}$$

$$Rev_{it} = \beta_2 SR_{it} + \beta_3 \left(SR_{it} \times R_i \right) + \ddot{a}^T X_{it} + \mu_i + \tau_t + \dot{o}_{it} \tag{2}$$

Variable definitions:
- Rev_{it}: government cigarette excise tax revenue in country i in year t
- SR_{it}: specific ratio, i.e., (specific excise tax rate)/(total excise tax rate at WAP)
- D_{it}^{high}: indicator equal 1 if $SR_{it} \geq 0.70$, 0 otherwise
- R_i: country-level dummy equal to 1 where policy frameworks produce regular increases in the specific tax (e.g., indexation), 0 otherwise
- $X_{it} = (\text{Inflation}_{it}, \text{IllicitShare}_{it})$: vector of controls
- μ_i: country fixed effects, τ_t: year fixed effects, ε_{it}: error term

The first specification captures potential non-linear, threshold effects when the specific component dominates the tax structure ($\geq 70\%$). The second traces the marginal effect of the specific ratio across its full range and tests whether that effect is systematically different in institutional environments with predictable, rule-based adjustments. With country and year fixed effects, identification comes from within-country variation over time, while time-invariant cross-country differences (including baseline market size) and common shocks are absorbed by μ_i and τ_t, respectively.

Empirical Results
This section presents the empirical results on the relation between cigarette excise tax structure and government revenue. The analysis draws on a panel dataset of EU member states, covering the period from 2010 to 2024, with Luxembourg excluded due to its distortionary effect from cross-border purchases. The findings are structured in three parts: first, the average revenue effects associated with a high specific ratio are reported; second, the interaction between countries relying heavily on specific taxes and indexation practices is explored.

**Revenue Effects in High-Specificity Countries**
Table 1 reports the basic regression results covering the years 2010 to 2024, with the dependent variable being cigarette excise tax revenues per capita. The results indicate that countries with a high share of specific excise taxes are associated with higher per capita tobacco tax revenues compared to those relying more on ad valorem taxation.

Table 1: OLS Regression Estimates – Revenue Effects in High-Specificity Countries

	Cigarette Excise Tax Revenue per Capita
High Specific Ratio	10.637* (0.0631)
Inflation	2.2729*** (0.0046)
Share of NDP	-1.5770*** (0.0000)
Country-Fixed Effects	Yes
Year-Fixed Effects	Year-Fixed Effects

This table reports the average slopes and p-values from yearly OLS regressions (Equation 1). Standard errors are heteroskedasticity robust. The table reports the estimates of a High Specific Ratio that is an indicator variable equal to one if the specific ratio is equal or exceeds 70% of the ETY. *, **, *** denote significance at the 10%, 5%, and 1% level.

Countries where specific excise taxes make up at least 70% have, on average, €11 more per capita than those with lower shares. The positive, statistically significant coefficient (p-value = 0.0631) supports this finding. Controlling for inflation and non-duty paid products (NDP), the data shows inflation raises revenue while higher NDP shares lower it. Overall, specific tax design has a clear, distinct impact on per capita revenue.
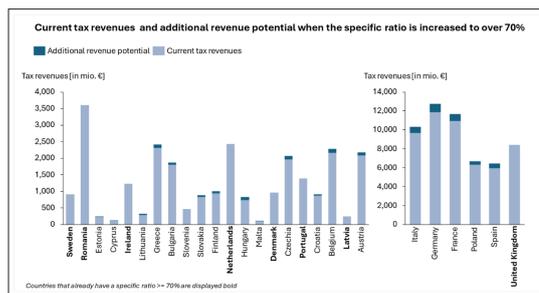
Figure 7: Current Tax Revenues and Additional Revenue Potential Per Country if the Share of the Specific Tax in Total Taxation Is Increased to over 70%

Note: Additional revenue potential based on cigarette excise tax revenue. The light blue bar represents current cigarette tax revenues (in million €, for the latest year available) and the dark blue segment shows the additional potential revenue, based on the regression results for the same year.

The regression results (as presented in Table 1) indicates that, on average, countries with a specific tax share above 70% collect €11 more cigarette tax revenue per capita. To calculate the total potential for each country, this per-capita effect was multiplied

by the respective national population. This suggests that a higher reliance on the specific tax component is generally associated with higher revenues.

Large EU countries like Italy, Germany, and France show strong potential for increased revenue from specific taxes. Germany alone could gain €888 million, or 7.5% more than current revenues. EU-wide, revenue potential ranges from 3.8% in Bulgaria to 14.0% in Hungary, totaling about €4 billion across the bloc. This estimate uses an average per-capita effect from regression analysis applied to the EU population. While actual increases will differ by country, the aggregate figure indicates substantial fiscal capacity at the EU level. These figures show average effects, while actual impacts differ by country. Nations like Sweden and Romania, already above a 70% tax share, will not see further positive effects or additional revenue and are highlighted in bold in the figure for clarity.

This difference in revenue highlights that the structure of taxation not only the rate can materially influence fiscal outcomes. This is further illustrated in Figure 7, which compares current tobacco tax revenues with the potential additional revenues that could be generated if all countries increased their specific ratio to above 70%. The chart shows considerable additional revenue potential in several large EU member states, particularly Germany, Italy, and Spain. Countries that already meet the 70% threshold are displayed in bold, highlighting the structural gap between high- and low-specificity systems.

This result shows that tax composition significantly affects revenue. Specific taxes, which are fixed per unit, offer more stable and predictable fiscal performance than ad valorem taxes, as they are less influenced by price changes and limit consumers switching to low-priced brands.

### Conditional Effects: The Role of Indexation

Further analysis shows that the positive effect of a high specific share is not unconditional: it depends critically on whether the specific component is regularly adjusted over time, for example through indexation. The regression results supporting this finding are presented in Table 2. The model includes an interaction term between the specific rate and an indexation indicator, allowing the analysis to distinguish between revenue effects with and without adjustment mechanisms.

Table 2: OLS Regression Estimates – Conditional Revenue Effects of Indexation

	Cigarette Excise Tax Revenue per Capita
Specific Ratio	-0.4243** (0.0371)
Specific Ratio * Indexation	0.4806** (0.0562)
Inflation	2.1168*** (0.0088)
NDP share	-1.5177*** (0.0000)
Country-Fixed Effects	Yes
Year-Fixed Effects	Yes

This table reports the average slopes and p-values from yearly OLS regressions (Equation 2). *, **, *** denote significance at the 10%, 5%, and 1% level. For information on cigarettes excise tax revenues please see Appendix.

The findings indicate that increasing the specific share alone does not improve fiscal outcomes unless regular adjustments are made. Without indexation, higher specific shares reduce per capita revenue but indexed specific taxes result in increased revenue for each percentage point rise. This approach treats the specific share as a continuous variable, enabling more precise estimates of marginal effects.
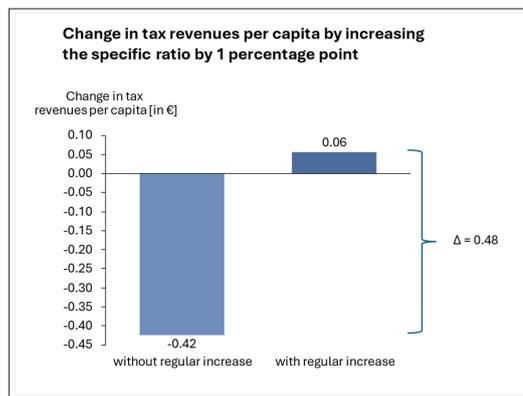
Figure 8: Change in Tax Revenues per Capita by Increasing the Specific Ratio by 1 Percentage Point – With vs. Without Indexation

Figure 8 visualises the estimated impact: in systems without indexation, a one percentage point increase in the specific share results in a decrease of €0.42 per capita, while systems with indexation see an increase of €0.06. This implies a differential effect of €0.48 depending on whether the tax is adjusted regularly. Scaled up, a 10-point structural adjustment could decrease or increase revenues by approximately €4.20 or €0.60, respectively.

This comparison shows that indexation not only preserves the value of the specific tax but is a necessary condition for ensuring its revenue-enhancing potential. The difference between these two scenarios (Δ = 0.48) highlights the importance of systematic indexation for maintaining the effectiveness of specific taxation.

The benefits of structural reform for greater specificity depend on keeping the real value of specific taxes stable. If not adjusted for inflation, their effectiveness and fiscal impact decrease. Improved revenue from a high specific share only occurs when regular adjustments maintain its real burden.

Discussion of results
Why Specific Excise Taxes Outperform

The results presented in the previous section reveal a robust empirical relation: countries with a higher reliance on specific excise taxes experience significantly higher per capita tobacco tax revenues, particularly 11€ higher (or 7% higher) on average than countries with a low specific ratio. Summing across all countries, the total additional revenue potential for the EU if their specific ratio increases to over 70% amounts to approximately €4 billion (applying the average per capita effect to the entire

EU population). This study provides strong empirical support for the view that specific taxation offers a stable fiscal base. Using panel data from 27 EU countries over more than a decade, fixed-effects regression confirms that regularly indexing specific tax rates to inflation significantly boosts revenue. Countries that frequently increase specific rates collect, on average, €0.60 more per capita for every 10-percentage point rise in the specific ratio. This section explains the mechanisms behind the results, using theory and data to clarify the findings. It demonstrates how the evidence supports and refines previous claims.

First, specific taxes offer greater predictability in revenue collection. Because they are levied as a fixed amount per quantity (e.g. per 1,000 cigarettes), they are independent on price fluctuations in the market. This has been consistently emphasized in the literature: Keen and WHO stress that specific taxation leads to more stable and less manipulable tax bases [3].

Second, specific taxes reduce price dispersion across brands, which limits consumers' ability to switch to cheaper alternatives in response to tax increases. Chaloupka et al. (2010) demonstrate that ad valorem taxes create wider price gaps across the market, encouraging down-trading and undermining the effective tax burden. This conclusion is echoed in more recent empirical work by Primorac et al., who find that specific-heavy excise structures are associated with both higher tax yields and greater price uniformity across cigarette brands [5]. Thus, a specific tax compresses price differentials and discourages substitution, preserving revenue and reinforcing public health goals.

Third, specific taxes are generally easier to administer and harder to manipulate. Because they are not linked to the declared value or price of the product, they reduce the opportunities for under-reporting or artificial price setting. This is echoed in World Bank, which highlights the administrative simplicity and enforcement advantages of quantity-based excise systems [18].

Fourth, regular adjustments or indexation of the specific component are crucial to maintain its real value over time. Without indexation, inflation erodes the purchasing power of the fixed tax, gradually weakening its effectiveness. This is widely recognized in international tax guidance and is consistent with the regression findings presented in this paper: only when specific taxes are paired with indexation do countries consistently achieve positive revenue outcomes from structural reform.

Taken together, these empirically grounded mechanisms and established theoretical claims provide a strong economic rationale for why a specific-heavy tax structure, when properly maintained, performs better in fiscal terms than systems that rely more heavily on ad valorem taxation.

Policy Recommendations
Derived from the empirical findings, highlighting how tax structure and implementation mechanisms can strengthen revenue performance, the following policy measures are recommended:

Adopt a Predominantly Specific Tax Structure
Increasing specific taxes in excise systems boosts government revenue (countries with high specific ratios collect €11 more

per capita on average) and provides stable, predictable fiscal outcomes that are less affected by price changes. Specific taxes are simpler to manage, reduce illicit trade, and reduce administrative costs. They also support public health by making cheap cigarettes less affordable and decreasing smoking rates.

Implement Regular Indexation of Specific Levels
he effectiveness of specific tax systems depends on regular adjustment mechanisms, such as indexation. As presented, countries with higher specific ratio and regularly increasing specific rates average €0.60 more revenue per capita for every 10-percentage point increase in the specific ratio. These mechanisms help maintain the real value of specific taxes over time, enhancing their ability to generate stable revenues.

Conclusion and Directions for Future Research
This paper has analysed the impact of cigarette excise tax structure on government revenues across the 27 EU member states over a 15 year period. Using a fixed effects panel framework, it compared the performance of specific and ad valorem taxation and assessed how design features such as indexation shape fiscal outcomes. The aim was to clarify whether greater reliance on specific excises enhances revenue stability and predictability, while also supporting public health objectives.

The evolution of the literature shows a clear shift from the early theoretical preference for ad valorem taxation (due to its pro-competitive effects) toward the recognition of specific taxation as the more effective and sustainable approach in the EU. Today, with stronger enforcement in place, excise tax policy is guided by three main considerations: fiscal stability, better health outcomes, and closer harmonization across Member States. These goals are most effectively supported by placing greater weight on specific taxation.

The empirical results show that countries with more than 70 percent specific excises collect about 11 euros more per capita in annual revenue. If all EU member states adopted this structure, the EU could gain an additional 4 billion euros. Moreover, the positive effects are strongest in systems where specific taxes are indexed to inflation, underscoring that design features matter as much as overall levels.

While this paper provides robust evidence on the revenue effects of cigarette excise tax structure in the EU, it deliberately focuses on a specific analytical scope: fiscal outcomes. Several important questions lie beyond this focus and suggest promising avenues for future research.

First, the study does not address the behavioural implications of different tax structures. Future research could combine revenue data with smoking prevalence, consumption, or health indicators to better understand the full impact of tax structure reform.

Second, the treatment of indexation is intentionally simplified to capture the presence or absence of regular adjustment practices. This approach facilitates comparability across countries, but future studies could investigate variation in the strength, design, or automaticity of indexation mechanisms and how this effect revenue performance.

Third, the analysis is limited to the 27 EU member states, which share a relatively harmonized regulatory environment. It remains an open question whether the findings can be generalized to non-EU or lower-income settings with different market structures or institutional constraints. Expanding this line of inquiry to global contexts would be a valuable contribution.

Finally, this study does not explore the political economy of tax structure reform. While the empirical results point to the effectiveness of specific and indexed taxation, understanding when and why governments adopt such structures requires a different methodological approach.

In sum, this paper contributes new empirical insights on an underexplored but highly policy-relevant question. By clarifying the revenue effects of tax structure design, it opens the door to further interdisciplinary research that can assess the trade-offs, feasibility, and long-term outcomes of excise tax reform [19-21].

References

1. Hines J, Summers LH. How Globalization Affects Tax Design. Tax Policy and the Economy. 2009.
2. Bucovetsky and Wilson. Tax Competition with Two Instruments. Regional Science and Urban Economics. 1991. 21: 333-350.
3. Keen. The balance between specific and ad valorem taxation. Fiscal Studies. 1998. 19: 1-37.
4. Primorac M, Jeric SV, Davidovic M. Effects of specific versus ad valorem excise taxes: empirical evidence on cigarette pricing in the EU. Empirica. 2024. 52: 357-376.
5. Delipalla S, Keen M. The comparison between ad valorem and specific taxation under imperfect competition. Journal of Public Economics. 1992. 49: 351-367.
6. Myles G. Imperfect competition and the optimal combination of ad valorem and specific taxation. International Tax and Public Finance. 1996. 3: 29-44.
7. Delipalla S. Tobacco tax structure and smuggling. Public Finance Analysis. 2009. 65: 93-104.
8. Kotsogiannis C, Serfes K. The comparison of ad valorem and specific taxation under uncertainty, Journal of Public Economic Theory. 2013. 16: 48-68
9. Goerke L. Commodity tax structure under uncertainty in a perfectly competitive market. Journal of Economics. 2008. 103: 203-2019.
10. Goerke L. The optimal structure of commodity taxation in a monopoly with tax avoidance or evasion. University of Tübingen working paper. 2011.
11. Delipalla S, O'Donnell O. The comparison between ad valorem and specific taxation under imperfect competition: evidence from the European cigarette industry. University of Kent Working Paper No. 9802. 1998.
12. Laffer A. Handbook of Tobacco Taxation: Theory and Practice. The Laffer Center at the Pacific Research Institute. 2014.
13. Primorac M, Jeric S. The structure of cigarette excises in the EU: from myths to reality. CESifo Working Paper. No. 6386. 2017.
14. Chaloupka FJ, Peck R, Tauras JA, Xu X, Yurekli A. Cigarette excise taxation: the impact of tax structure on prices, revenues, and cigarette smoking. NBER Working Paper 16287. 2010.
15. World Bank. Tobacco tax reform at the crossroads of health and development. 2017.
16. International Monetary Fund (IMF). Fiscal policy: how to design and enforce tobacco excises? 2016.
17. World Bank. Confronting illicit trade in tobacco. 2019.
18. World Bank. Tobacco excise taxes and tobacco leaf farming. 2023.
19. Geboers C, Candel M, van Walbeek C, Nagelhout G, de Vries H, et al. Widening the price gap: the effect of the Netherlands' 2020 tax increase on tobacco prices. Nicotine & Tobacco Research. 2024. 27: 733-740.
20. WHO. Global health observatory data repository. 2014.
21. WHO. Report on the global tobacco epidemic 2023. 2023.
22. WHO. Health tax reforms – challenges and lessons learnt. 2024.