



Impact of Excise Tax on Cigarette Consumption: Evidence from Panel Data in Kyrgyzstan

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Motivation

The tobacco market in Kyrgyzstan consists of traditional tobaccos, which make up 95 percent of the market. And e-cigarettes make up the remaining 5% (NSCKR, 2023).

In 2017, the government increased the excise duty on filtered cigarettes from 750 to 1,000 soms per 1,000 pieces (Tax Law of Kyrgyzstan).

The goal was to reduce tobacco consumption by 25% and generate an additional USD 32 million in annual excise tax revenue (Gov. Plan, 2017).

However, the actual outcomes of this policy have been mixed. While the legal cigarette market has indeed decreased by 49%, this has not translated into a significant reduction in the number of smokers. Instead, we have seen a troubling rise in tobacco smuggling.

Background Information

- The number of shadow tobacco dealers has increased, resulting in an annual loss of \$6 to \$7 million in tax revenue.
- Despite the bans and high prices, the number of smokers does not fall. The smoking rate remains high, with 45% of men and 2.7% of women still smoking in Kyrgyzstan (NSCKR, 2023).
- Although this excise tax reduces the legal tobacco market, it undermines the effectiveness of the policy and stimulates the illegal market.

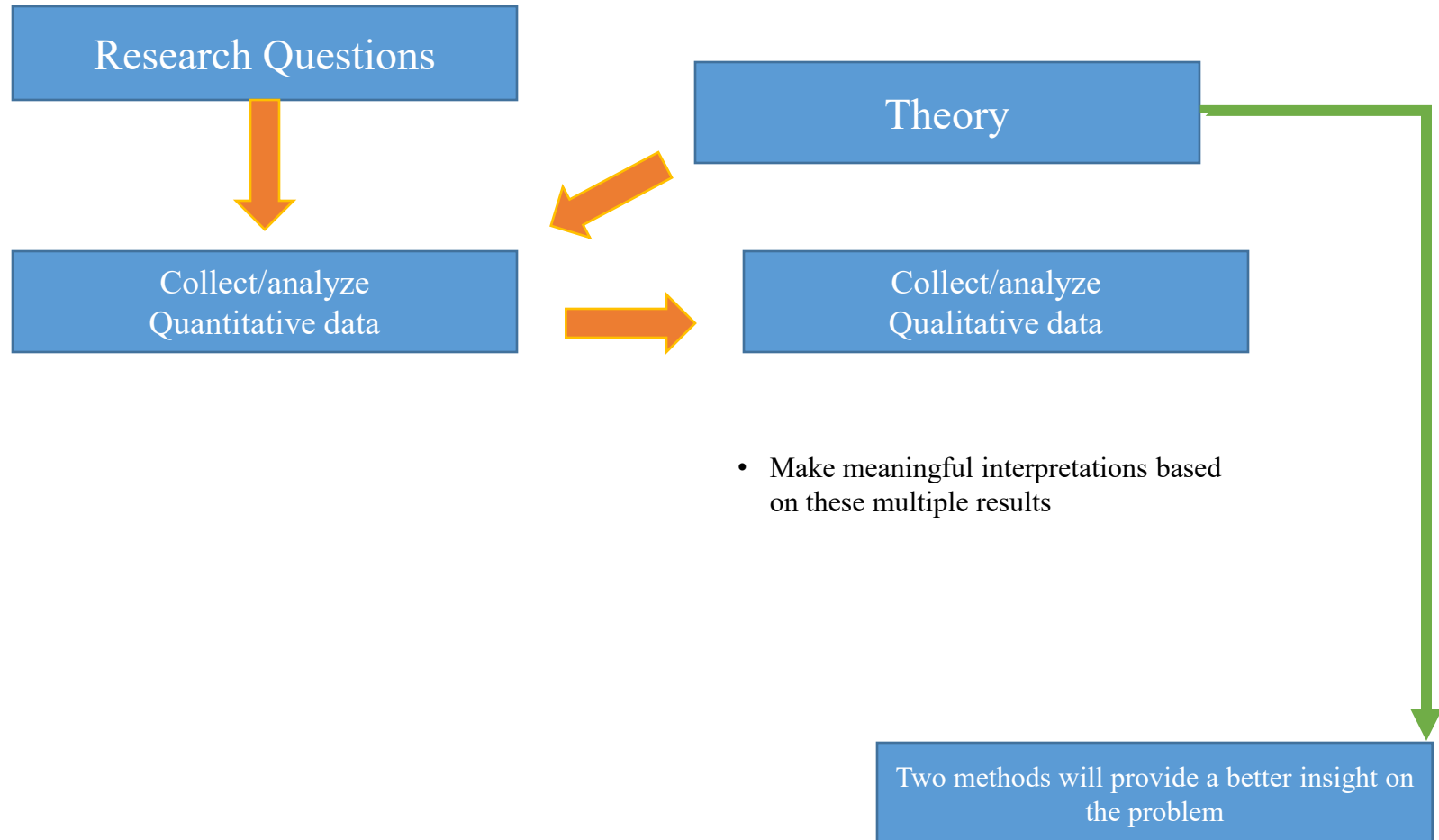
Research Questions

1. What is the impact of excise tax on cigarette consumption?
2. How do men and women react to higher excise taxes?

Data

- The data for the current study is taken from the survey “Life in Kyrgyzstan (LIK)”
- Panel survey conducted annually 2016 and 2019
- The data are representative at the national level
- 3000 households and 8000 individuals over time

Research Design: Mixed Method



Method –Difference in Differences

$$\bullet Y_{ivt} = \beta_0 + \beta_1 T_i + \beta_2 t_i + \beta_3 (t_i * T_i) + \beta_4 X_i + \varepsilon_i$$

where i is household, v is village and t is time.

Y_{ivt} : refers to the annual consumption of cigarettes in pieces

T : Treatment indicator showing smokers based on the income such as low income smokers and high income smokers

t : time indicator (1: is a dummy variable indicating the year for post-tax increase period when the tax reform has occurred, 0: pre tax period indicating the year before the excise tax increase)

$t*T$: interaction term: causal effect of the excise tax and called DD

X_i : vector of household characteristics and other village characteristics

β_1 : Measures the difference between two groups before excise tax

β_2 : Measures change across time for control group

β_3 : Effect of the shock (DID)

Empirical Strategy

1. Year 2016

Treatment: Low
income smokers

Control: High
income smokers

2. Year 2019

T

C

Treatment: Low
income smokers

Control: High
income smokers

$$DD = E(Y_{2019}^T - Y_{2016}^T | T_1 = 1) - E(Y_{2019}^C - Y_{2016}^C | T_1 = 0)$$

Preliminary Findings (DID)

$$\text{Cigarette consumption} = \beta_0 + \beta_1 T_i (\text{Excise Tax}) + \beta_2 t_i (\text{year_2019}) + \beta_3 (t_i * T_i) + \varepsilon_i$$

Independent Variables	Coefficient	Prob
Year_2019 (t)	357**	0.020
Low income smokers (T)	-326	0.140
Year_2019X Low income smokers (t*T)	857**	0.025
Constant	3377***	0.000

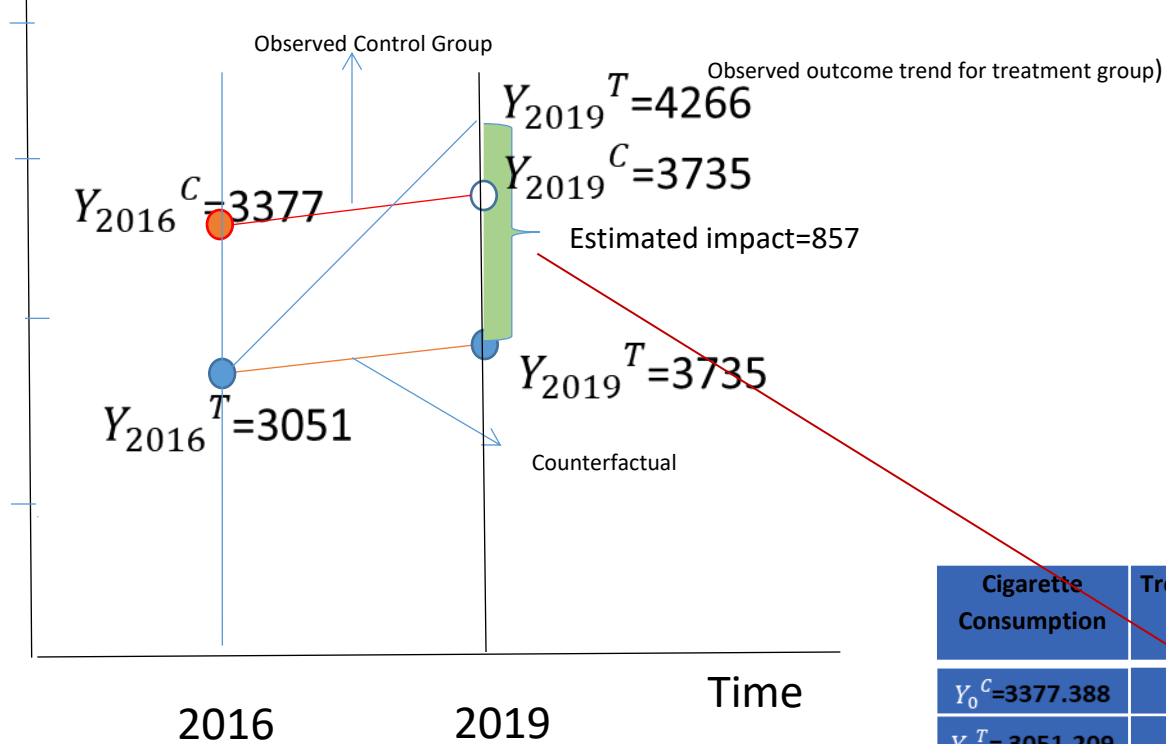
$$DD = E(Y_1^T - Y_0^T | T_1=1) - E(Y_1^C - Y_0^C | T_1=0)$$

t	T	Cigarette Consumption	Treat	Control	DiD=T-D
0	0	$Y_0^C = 3377.388$			
0	1	$Y_0^T = 3051.209$		357.901	
1	0	$Y_1^C = 3735.289$	1215.025		857
1	1	$Y_1^T = 4266.234$			

DiD

$$\text{Cigarette Consumption} = 3377 - 326T + 357t + 857Tt + e$$

Cigarette Consumption



Cigarette Consumption	Treat	Control	DiD=T-D
$Y_0^C = 3377.388$			
$Y_0^T = 3051.209$		357.901	
$Y_1^C = 3735.289$	1215.025		857
$Y_1^T = 4266.234$			

Results: DiD among Female and Male

	DiD	DiD with control	Among Female	Among Male
Treatment variable	-326 0.140	-307 0.16	-143 0.89	-305 0.17
Time variable	357** 0.020	286* 0.06	583 0.35	278* 0.08
Interaction Term (Treatment*Time)	857** 0.025	953** 0.01	-486 0.75	1074*** 0.006
Household size		-50.50* 0.06	-51.07 0.66	-55.79** 0.04
Age		15.73*** 0.003	-2.77 0.89	17.14*** 0.002
N	1,430	1,430	80	1,350
r2_w	0.012	0.02	0.017	0.024

Qualitative Result

Question 1: Can you tell us more about your views on the impact of increasing the excise tax on cigarettes?

Answer: "From my perspective, raising the excise tax on cigarettes will not necessarily lead to a decrease in smoking. Instead, it might drive people to seek cheaper, often illegal, alternatives"

Question 2: Can you elaborate on why you believe higher taxes won't reduce cigarette consumption?

"Many smokers are addicted to nicotine, so their demand for cigarettes is relatively inelastic. Even if legal cigarettes become more expensive due to higher taxes, these individuals will still find ways to satisfy their addiction. They might turn to smuggling, counterfeit products, or black market cigarettes, which are often cheaper and not subject to the same taxes" (X Respondent, May 2024).

Thematic Table Analysis of Interview Notes

Theme	Details from Interview	Implications
Effectiveness of Tax Increases	Higher taxes won't reduce smoking due to nicotine addiction.	Suggests that addiction drives continued consumption regardless of price increases.
Shift to Illegal Alternatives	Smokers might turn to smuggling, counterfeit, or black market cigarettes.	Highlights a potential unintended consequence: increased demand for illegal products, which are unregulated and potentially more harmful.
Health Risks	Illegal cigarettes may contain more harmful substances.	Raises concerns about the health impacts of unregulated tobacco products, which could worsen public health outcomes.
Support for Criminal Activities	Purchasing illegal cigarettes supports organized crime.	Indicates broader societal issues linked to illegal cigarette trade, including financing of criminal enterprises.
Youth Sensitivity to Prices	Higher taxes might deter some young people from starting to smoke.	Acknowledges that tax increases could have a positive impact on reducing smoking initiation among price-sensitive youth.
Comprehensive Approach Needed	There is a need for education, support for quitting, and enforcement against illegal sales.	Advocates for a multifaceted strategy to effectively reduce smoking rates, rather than relying solely on tax increases.
Demand and Availability	Simply increasing taxes without addressing demand and availability of illegal products is ineffective.	Emphasizes the importance of addressing both the demand for cigarettes and the supply of illegal alternatives to ensure the success of tax policies.

Conclusion

- DiD's two-year panel analysis shows that excise tax reform did not achieve its intended effect, but also had the opposite effect among men.
- The excise tax reform did not lead to a decrease in cigarette consumption, but, on the contrary, increased it.
- The gender response to the excise tax is different as men increased their consumption and women decreased their consumption.
- The income response to the excise tax also differs among low- and high-income smokers. Low-income smokers consumed more cigarettes compared to high-income smokers.
 - This study provides evidence that higher taxes may increase smoking among men and low-income people. This is due to cigarette addiction and shift to illicit cigarette markets.
 - This can lead to increased poverty and subsequently lead to negative health consequences.

Recommendation Policies

- Programs such as the Quit and Save initiative are aimed not only at smoking cessation, but also at financial savings from quitting.
- Organize workshops in communities with high smoking rates and low-income populations. These workshops should cover budgeting, saving, and the financial implications of smoking.
- Implement financial literacy curricula in schools, particularly in low-income areas, to educate young people about the financial and health costs of smoking before they start.
- Launch public awareness campaigns that highlight the financial burdens of smoking. Use infographics, and interactive tools to demonstrate the potential savings from quitting smoking. Collaborate with media outlets and social media influencers to broaden reach.
- By integrating financial education into public health initiatives, community programs, and schools, policymakers can help individuals make decisions that benefit their long-term financial and health outcomes.

Thank you for your attention!