Elasticities of Demand for Cigarette and Waterpipe Tobacco Products in Three Eastern Mediterranean Countries

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DECLARATIONS

- This research presentation is a part of a series of research papers produced by the Eastern Mediterranean Consortium on the Economics of Waterpipe Tobacco Smoking (ECON-WTS).
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BACKGROUND

- Waterpipe tobacco smoking is a traditional tobacco use method that originated in the Eastern Mediterranean Region and has had a global resurgence in recent years.
- Waterpipe smoking rates in the region are among the highest worldwide, with the lowest prices of tobacco products among all WHO regions.
- Tobacco product prices are an important factor when considering that decreasing affordability is the most effective measure to reduce the uptake of smoking among young people

BACKGROUND (cont'd)

- The WHO Framework Convention on Tobacco Control (FCTC) recommends that taxation policy should take into account price elasticity of demand in order to reduce consumption and prevalence of tobacco use
- The FCTC also recommends that all tobacco products should be taxed comparably to avoid unintended consequences, such as product substitution or increases in illicit trade
- Available estimates in the EMR of adult demand elasticities for smoking products are poorly understood and often limited to cigarette smoking.

AIM

- Present recent and comprehensive own- and cross-price elasticities of demand for cigarettes and Waterpipe tobacco products in three Eastern Mediterranean Region (EMR) countries:
  - Lebanon
  - Jordan
  - Palestine
- Discuss the implications of these results to taxation and other fiscal policies aimed at tobacco control in the EMR

METHODS

STUDY POPULATION

- Study based on survey that included:
  - HH questionnaire
  - Volumetric Choice Experiment (VCE) – core exercise
- Data were collected using nationally-representative household samples of adults (18+ years old) in Lebanon, Jordan, and Palestine
- Participants were selected using a multistage cluster sampling approach with probability-proportional-to-size random selection method.
- In each country, the sample of households was chosen in two stages:
  1. selecting well-defined geopolitical clusters within each governorate
  2. selecting housing units within each cluster.
- Participants were enrolled from all 8, 12 and 9 governorates in Lebanon, Jordan the West Bank, Palestine, respectively

STUDY PROCEDURES

- Study staff consented participants and used electronic tablets to administer the survey
- The HH questionnaire:
  - Assessed sociodemographic characteristics + cigarette and WP smoking behaviors
  - Based on prior validated surveys
- Questionnaire pre-tested using cognitive interviews to ensure respondent comprehension.
- Study protocols were approved by the IRB's of the :
  - American University of Beirut (Lebanon)
  - Jordan University of Science and Technology (Jordan)
  - Birzeit University (Palestine).

EXPERIMENTAL PROTOCOL

- VCEs offer the advantages of:
  - understanding demand for products in the lack/absence of actual market data
  - avoiding endogeneity problems inherent in actual market data when available through the randomization of attribute levels
- By simultaneously offering multiple distinct volumetric choices b/w competing products, VCEs allow for the estimation of a complete set of:
  - own-price elasticities
  - cross-price elasticities

EXAMPLE CHOICE SET

Based on the following prices, think about the number of cigarettes and waterpipe products you would purchase?

8-way choices

	(1) Cigarettes premium Pack of 20	(2) Cigarettes discount Pack of 20	(3) WP tobacco premium 250g pack	(4) WP tobacco discount 250g pack	(5) Non-flavored WP tobacco 250g pack	(6) WP home delivery 1 WP	(7) WP café session premium 1 WP	(8) WP café session discount 1 WP
Price	LBP2,500	LBP750	LBP13,500	LBP10,250	LBP20,000	LBP7,500	LBP15,000	LBP7,500
Quantity	|____|	|____|	|____|	|____|	|____|	|____|	|____|	|____|

Was replaced with Roll your own cigarettes in Palestine

Each product varied according to 4 price levels, the base price reflecting current average market prices in each country, each price level reflecting a 50% incremental increase

ECONOMETRIC ANALYSIS

- Zero-Inflated Poisson (ZIP) regression to account for excess of zero counts/censoring
- For any tobacco product, the model has two parts
  - Logit model for predicting excess zeros

    f { sociodemographics + current smoking status }
  - Poisson count model

    f { 1 x own-price + 7 x cross-prices + income }
- In each country → 8 x ZIP models corresponding to the 8 products under examination
- Log(price) coefficients → coefficients interpreted as own- and cross-price elasticities

RESULTS

SAMPLE CHARACTERISTICS

- The survey was completed by a total of:
  - 1,680 respondents in Lebanon (50% female)
  - 1,925 in Jordan (44.6% female)
  - 1,679 in Palestine (50% female).
- Substantially larger % of current general smokers in Lebanon (70.9%) vs. Jordan (40.2%) or Palestine (36.8%)
- Pattern most pronounced in current WP smoking:
  - Lebanon (39.5%) more than 3x Jordan (11%) and Palestine (12.9%)

SAMPLE CHARACTERISTICS (cont'd)

- Age distribution exhibited similar patterns in all three countries:
  - nearly 2/3 of respondent aged 45 or less
- Lebanon stood out in terms of its higher proportion of full-time employment:
  - 44.5% compared to 34.4% in Jordan and 34.0% in Palestine
- As for education, the proportion of respondents with high education was highest in Jordan (25%) followed by Lebanon (20.7%) and Palestine (16.1%)

MONTHLYIZED STATED PURCHASES OF TOBACCO PRODUCTS

	Lebanon (N=13,440)		Jordan (N=15,400)		Palestine (N=13,432)	
Tobacco product	Mean	% Null	Mean	% Null	Mean	% Null
Premium cigarettes	4.98	89.6%	3.90	90.7%	3.67	92.8%
Discount cigarettes	14.24	75.6%	6.11	86.4%	1.85	96.4%
Roll-your-own cigarettes	-	-	-	-	0.56	99.5%
Premium waterpipe tobacco	7.16	83.6%	1.03	96.6%	1.13	97.0%
Discount waterpipe tobacco	6.30	86.3%	0.54	97.6%	0.11	99.4%
Non-flavored waterpipe tobacco	0.81	98.6%	0.02	99.5%	-	-
Waterpipe tobacco home delivery	1.89	94.6%	0.01	99.5%	0.08	99.5%
Premium waterpipe café	0.40	89.4%	0.08	98.4%	0.12	97.7%
Discount waterpipe café	0.45	90.1%	0.16	98.1%	0.21	96.2%

Lebanon stated larger purchases of all 8 cigarette and waterpipe products

This was driven by the fact that respondents in Lebanon exhibited the lowest proportion of null stated purchases across all products

OWN- PRICE ELASTICITIES

Tobacco product	Lebanon	Jordan	Palestine
Premium cigarettes	-1.157***	-1.080***	-1.042***
Discount cigarettes	-0.639***	-0.719***	-1.209***
Roll-your-own cigarettes	-	-	-0.065
Premium WP tobacco	-1.949***	-0.601***	0.196*
Discount WP tobacco	-1.700***	-0.915***	-0.650**
Non-flavored WP tobacco	0.095	0.816***	-
WP tobacco home delivery	-1.869***	0.104	-0.379
Premium WP café	-2.312***	-0.674***	-1.120***
Discount WP café	-1.699***	-0.335**	-0.291**

*** p < .01; ** p < .05; * p <0.10.

FURTHER INSIGHTS & DISCUSSION

LEBANON

Compared to previous estimates (Salti et al., 2015):

- Price elasticity for premium cigarettes **(-1.2)** > published elasticity for imported (i.e., typically premium) cigarettes **(-0.2)**
- Price elasticity of discount cigarettes **(-0.6)** < published elasticity for local (i.e., typically discount) cigarettes **(-1.5)**
- Price elasticity of premium WP **(-1.4)** ≈ published elasticity for WP tobacco **(-1.9)**
- Cross-price elasticity estimates between WP and cigarettes were **≈ 0**, consistent with Salti et al.

JORDAN

Compared to Sweis and Chaloupka (2014):

- Sweis and Chaloupka do not differentiate between premium and discount cigarettes
- Price elasticity for discount cigarettes **(-0.7)** ≈ to published elasticity for cigarettes (-0.6)
- Price elasticity for premium cigarettes **(-1.1)** > published elasticity for cigarettes **(-0.6)**

IN GENERAL

- Cross-price elasticities between store-purchased WP tobacco and WP café smoking sessions is weak and inconsistent

  → not close substitutes
- Estimates in this study are **broadly consistent** with previous ones but differences may be attributed to **differences in methodology and temporal contexts**

CONCLUSION

- First study to offer robust information on the economic relationship between cigarette and WP smoking in EMR countries where both products are highly-prevalent
- Strong evidence that raising tobacco taxes could significantly reduce tobacco use in the EMR while increasing government revenues.
- Timely policy-relevant data to evaluate the potential effects of taxes and other fiscal tools in the 3 countries + potentially extrapolate to other countries in the region:
  - Tobacco consumption
  - Public revenues
  - Substitution between cigarettes and WP products under price increases

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