

Economic Models to Evaluate Taxes on NCD Risk Factors: Applications to Alcohol, Tobacco and Sugar Sweetened Beverages

12th CARIBBEAN
CONFERENCE ON
NATIONAL HEALTH
FINANCING INITIATIVES

HOTEL TORARICA,
SURINAME

8-10 OCTOBER, 2018

Samuel Gabriel
HEU, Centre for Health
Economics, The UWI



HEU, Centre for Health Economics, *Making A Difference.*



Presentation Outline

- Methodology and Data Requirements of the Economic Models and Data Sources.
- Findings from applications to Alcohol, Tobacco and Sugar Sweetened Beverages(SSB).
- Recommendations for optimization of benefits of utilizing these models and tax revenues.

Methodology and Data: TaXSiM(1)

- ⊙ WHO tax simulation model – TaXSiM
- ⊙ TaXSiM requires:
 - Clear understanding of the tax system.
 - Measures of price elasticities of demand by brand segments, current tax rates by types.
 - Prices and Sales (as a proxy for consumption), by brand.
 - Tax revenues by tax type.

Methodology and Data: TaXSiM(2)

- ⊙ TaXSiM begins by recreating the initial (base year) tax system.
- ⊙ The TaXSiM model estimates baseline values for a number of variables of interest including:
 - Average excise tax per unit
 - Average price per unit
 - Sales volumes (consumption)
 - Total tax revenues and excise tax revenues

Methodology and Data: TaXSiM(3)



Once the baseline recreated, simulations can begin:



**Model allows for simulated changes to almost the entire tax system including:
Tax rates, taxes bases, new taxes can be imposed and existing taxes discontinued.**



The model produces output showing the impact of changes.

Methodology and Data: LA-AIDS (1)



The Almost Ideal Demand System (AIDS) is a popular model for estimating demand for consumer items.



A simplification of the AIDS model gives the Linear Approximation of the AIDS, the LA-AIDS.

Methodology and Data- LA-AIDS (2)



These models allow us to produce own-price and cross price elasticities of demand.



These tell us how the consumer will respond to price changes, both the price of the product of interest and its related products.



Data Requirements:

- Prices of the products (SSB)**
- Consumer expenditure on goods.**

Data Sources

- Customs Departments
- Supermarkets and other retailers
- Ministries of Finance, Statistical Offices
- International Wines and Spirits Record (IWSR)
- Local Producers and Producers associations.

Application: TaXSiM, Alcohol

- In 2015 TaXSiM was used to simulate the impact of tax changes on consumption of alcohol (and tobacco) and related Government revenue.
- Study: Evaluation of Port of Spain Declaration on NCDs (IDRC funded).

Application: TaXSiM, Alcohol

Items	Government Revenue (Chance, % Change)	Baseline 2014	Jamaica		Trinidad and Tobago		
			Percentage Fall in Consumption				
			-5%	-10%	Baseline 2014	-5%	-10%
Beers	Revenue Changes (US\$ ‘000)						
	Excise Revenues	7,448	3,256	6,048	1,698	472	870
			46%	86%		28%	51%
	Total Revenues	21,720	3 337	6,126	3,166	483	884
			16%	30%		15%	28%
Spirits	Excise Revenues	18,050	1,861	3,369	24,069	1,540	2,780
			11%	20%		6%	12%
	Total Revenues	45,756	2,079	3,639	30, 974	1,604	2,864
			5%	8%		5%	9%

Application: TaXSiM, Tobacco

- In 2017 HEU and World Bank used TaXSiM to simulate the impact of tax changes on consumption of tobacco and related Government revenue.
- Trinidad and Tobago and the OECS countries were examined.

Application: TaXSiM, Tobacco

- ⊙ Study's Aim: Harmonization of tobacco taxes in OECS.
- ⊙ Which minimizes price differentials and cross border smuggling.
- ⊙ Increases the effective of fiscal-based prevention efforts.

Taxes	St. Kitts and Nevis (2017)		Saint Vincent and the Grenadines (2017)		Grenada (2017)		St. Lucia (2017)		Antigua & Barbuda (2017)	
	Rate	Base	Rate	Base	Rate	Base	Rate	Base		Base
Import Duty (ID)/CET	EC\$18	per kg	35 % - Cigar and cigarettes 5 % raw tobacco	CIF	35 % -cigarettes 5%- tobacco	CIF	5 % on stemmed/stripped tobacco 45% on cigars, cigarettes, and other forms of tobacco and tobacco products.	CIF	35 %	C.I.F
Excise Tax	20 %	CSC+ID	14 % -cigars EC\$1.55 per 100 cigarettes 6% raw tobacco 12% other 6% – tobacco substitute	ID +CIF	105 % -cigarettes	CSC+CET+ CIF	EC\$176 per 1,000 Sticks on cigarettes EC\$125.60 per kg on cigars and other tobacco products.			
Value Added Tax	17 %	EXT+CS C+ID	16 %	CSC+ EXT+ ID +CIF	15 %	EXT+CSC+ CET+CIF	12.5 %	EXT+ CSC+ID +CIF	15 %	CIF+ID
Customs Service Charge	6 %	ID	5 %	EXT+ ID +CIF	6 %	CET+CIF	6 %	ID+CIF		
Other taxes (RRC)									10 %	CIF

Application: TaXSiM, Tobacco (OECS)

	St. Vincent and the Grenadines				Antigua and Barbuda			
SUMMARIZED OUTPUT	BASELINE 2018 (PROJECTED)	SCENARIO 2 2019	SCENARIO 2 2020	SCENARIO 2 2021	BASELINE 2018 (PROJECTED)	SCENARIO 2 2019	SCENARIO 2 2020	SCENARIO 2 2021
Specific Excise Tax Per Pack (20s)	0.31	0.75	1.85	4.00	-	0.80	1.90	4.00
% change		141%	147%	116%			138%	111%
Total Revenues (EC, M)	3.367	4.320	6.696	10.422	3.348	5.616	8.478	13.149
Excise Revenues (EC, M)	.675	1.566	3.537	6.588	-	2.025	4.455	8.451
Change in Consumption (%)	-	-2.9	-8.1	-13.5	-	-6.5	-7.1	-10.1

Application: TaXSiM, Tobacco (TT)

SUMMARIZED OUTPUT	BASELINE 2017 PROJECTED	SCENARIO 1 2018	SCENARIO 1 2019	SCENARIO 1 2020	SCENARIO 2 2018	SCENARIO 2 2019	SCENARIO 2 2020
Excise Tax Per Pack (20s)	TTD4.38	TTD6.57	TTD13.14	TTD26.28	TTD10.95	TTD21.90	TTD43.80
% change	-	50%	100%	100%	150%	100%	100%
Total Revenues (TT, B)	0.408	0.367	0.659	1.134	0.565	0.983	1.654
Excise Revenues (TT, B)	0.455	0.533	0.863	1.407	0.755	1.233	2.006
Change in Consumption (%)	-	-3.9	-10.3	-14.0	-11.3	-13.1	-15.9

Application: LA-AIDS, SSB (In Progress)

- ⊙ Joint IECS/HEU study and a multiagency Food and Nutrition project (FaN).
- ⊙ Countries involved: Trinidad and Tobago, Argentina, SVG, St. Kitts and Nevis, El Salvador and Brazil (IDRC funded).



Application: LA-AIDS, SSB (In Progress)

- The elasticities produced can be used in TaXSiM.
- Studies will look at using taxes to discourage SSB and other unhealthy food consumption.
- Raising revenues to help fund NCDs response.



How to Optimization the Benefits of Utilizing these Models(1)

- **Biggest Benefit:** Getting the authorities to take the results seriously.
 - Make sure your data are correct - check, recheck and crosscheck.
 - In the case of TaXSiM, make sure baseline matches (Very Closely!!) figures reported by revenue authorities.
 - Work closely with and ask for feedback (regarding your results) from the authorities.



How to Optimize the Benefits of Utilizing these Models(2)

- Potential areas of application:
 - To examine the consumption impact and thus health outcomes of fiscal measures designed to influence consumer behaviour.
 - To evaluate the potential revenue impact of such measures.
 - To evaluate the impact of general product-specific taxation policy.



How to Optimization the Benefits of Utilizing these Tax Revenues.

Make an effort to identify and quantify tax revenues directly derived from these products.

In an environment with extremely scarce resources, there is wisdom in concentrating on prevention efforts.

Thank
You!