

Technical Annex of the report

PERFORMANCE ASSESSMENT ON REGIONAL LEVEL OF AUTHORITIES WITH MANDATE TO COMBAT ILLICIT TRADE IN CIGARETTES

ILLICIT TOBACCO TRADE PRESSURE: INDICATORS TESTED

No.	Code	Name	Outcome	Included
1	DV	Share of non-domestic cigarettes from total sample (EPS/Novel data, dependent variable)	Dependent variable: Illicit Tobacco Levels (ITL), %	Yes
2	f1	Seized cigarettes by the police out of the total estimated illegal cigarettes on the market (ratio)	Significant negative link (the higher the ratio of seized cigarettes / total illegal cigarettes, the lower the ITL).	Yes
3	f24	Seized cigarettes by the customs (DGV) out of the total estimated illegal cigarettes (ratio)	Significant negative link (the higher the ratio of seized cigarettes / total illegal cigarettes, the lower the ITL).	No
4	f1	Seized cigarettes by the border police out of the total estimated illegal cigarettes on the market (ratio)	Significant negative link (the higher the ratio of seized cigarettes / total illegal cigarettes, the lower the ITL).	No
5	f3	Policemen per capita	Significant negative link (the higher the number of policemen per capita, the lower the ITL).	Yes
6	f4	Completed nights from foreign citizens per capita	Significant negative link (the higher the number of completed nights per capita, the lower the ITL).	Yes
7	f7	Average annual wages	Strong negative link (the higher the wages, the lower the ITL).	Yes
8	f13	Registered crimes against property per capita	Strong positive link (the higher the number of property crimes registered by the police, the higher the ITL).	Yes
9	f26	Issued administrative penalty decrees by customs authorities per capita	Strong positive link (the higher the number of penalty decrees per capita, the higher the ITL).	Yes
10	f18	Hooliganism per capita	Significant negative link (the higher the number of registered cases per capita, the lower the ITL).	No
11	f21	Registered cases of illicit trade per capita	Not enough data, not significant (probably because of the few data)	No

No.	Code	Name	Outcome	Included
12	f19	% of solved cases of illicit trade	Not enough data, not significant (probably because of the few data)	No
13	f20	Arrested dealers ratio (the ratio between the number of dealers found and an expert estimate of the total number of dealers)	Not significant; multicollinearity problems (correlated with f19)	No
14	f23	Customs: ratio between administrative penalties and checks	Not significant; multicollinearity problems (correlated with f25, f26)	No
15	f25	Checks done by the customs per capita	Not significant; multicollinearity problems (correlated with f23, f26)	No
16	f10	Total registered crimes per capita	Not significant; multicollinearity problems (correlated with other number of crime indicators)	No
17	f11	Crimes against the person per capita	Not significant; multicollinearity problems (correlated with other number of crime indicators)	No
18	f12	Murder per capita	Multicollinearity problems (correlated with other number of crime indicators)	No
19	f14	Other types of crimes per capita	Not significant; multicollinearity problems (correlated with other number of crime indicators)	No
20	f15	Car thefts per capita	Multicollinearity problems (correlated with other number of crime indicators)	No
21	f16	Drug related crimes per capita	Not significant; multicollinearity problems (correlated with other number of crime indicators)	No
22	f17	Arson per capita	Not significant; multicollinearity problems (correlated with other number of crime indicators)	No
23	f8	Unemployment rate	Not significant	No
24	f9	GDP per Capita	Multicollinearity problems (correlated with f7)	No
25	f5	Minority population at risk (% of the whole 16+ population)	Not significant	No
26	f6	Bordering Risk Country (region which is near the border with other countries with lower excise rates)	Not significant	No

No.	Code	Name	Outcome	Included
27	f2	Risk Region (expert assessment based on whether is near the illicit tobacco routes or not), binary	Not significant	No

Final regression model:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.601 ^a	0.361	0.338	0.10	0.361	15.186	6	161	0.000

a. Predictors: (Constant), f26 f13, f1, f3, f7, f4

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics		Group of indicators
	B	Std. Error	Beta			Tolerance	VIF	
(Constant)	0.17	0.025		6.606	0.000			
f1 Seized cigarettes by the police out of the total estimated illegal cigarettes on the market (ratio)	-0.56	0.277	-0.13	-2.006	0.047	0.913	1.096	subindex 1
f3 Policemen per capita	-0.08	0.034	-0.15	-2.233	0.027	0.864	1.158	subindex 2
f4 Completed nights from foreign citizens per capita	-0.14	0.046	-0.21	-2.957	0.004	0.809	1.237	subindex 3
f7 Average annual wages	-0.33	0.054	-0.42	-6.158	0.000	0.847	1.180	
f13 Registered crimes against property per capita	0.22	0.042	0.39	5.315	0.000	0.735	1.360	subindex 4
f26 Issued administrative penalty decrees by customs authorities per capita	0.15	0.036	0.29	4.278	0.000	0.882	1.133	

Dependent Variable: Share of non-domestic cigarettes from total sample (EPS data)

To compute the aggregated indicator ITT Pressure, first the four sub-indexes are computed: those which consist of two primary indicators are computed as the weighted mean where weights reflect relative importance derived from the standardized beta in the table above. ITT Pressure is once again computed as the weighted mean of the four sub-indexes with weights derived from a regression model with the four

sub-indexes as independent variables and the share of non-domestic cigarettes from total sample as a dependent variable.

Indicator	Weight	Level of computation
f4 Completed nights from foreign citizens per capita	-0.20	Computation of the four sub-indexes
f7 Average annual wages	-0.22	
f13 Registered crimes against property per capita	0.31	
f26 Issued administrative penalty decrees by customs authorities per capita	0.20	
subindex1 Police efficiency in confiscating illegal cigarettes	-0.213	Computation of ITT Pressure
subindex2 Police force strength	0.012	
subindex3 Economic development of the region	-0.261	
subindex4 Criminal activity of networks related to illegal cigarettes	0.185	

The ITT Pressure indicator can be computed even when some of the components are missing. In case one of the two primary indicators for Sub-index 3 or sub-index 4 are missing, the sub-index is computed based on the other primary indicator. In case any of the sub-indexes is missing, the ITT Pressure is computed as the weighted mean of the remaining indicators with the divisor remaining always the same regardless of whether all four components are present or fewer.

**ILLICIT TOBACCO TRADE PRESSURE: 2017
ROMANIA**

Vaslui	0.86
Botoșani	0.82
Neamț	0.80
Caras-Severin	0.79
Covasna	0.78
Hunedoara	0.77
Brăila	0.76
Vrancea	0.73
Bistrița-Năsăud	0.72
Suceava	0.72
Vâlcea	0.71
Mehedinți	0.71
Satu Mare	0.70
Tulcea	0.70
Arad	0.69
Galați	0.69
Bacău	0.69
Harghita	0.68
Călărași	0.68
Maramureș	0.67
Constanța	0.66
Olt	0.66
Bihor	0.66
Iași	0.65
Dolj	0.64
Giurgiu	0.63
Mureș	0.62
Dâmbovița	0.59
Argeș	0.57
Timiș	0.51
Prahova	0.48
Municipiul București	0.37
Sălaj	0.34
Buzău	0.31
Alba	0.29

**ILLICIT TOBACCO TRADE PRESSURE: 2016
ROMANIA**

Vaslui	0.88
Botoșani	0.83
Neamț	0.81
Brăila	0.79
Covasna	0.78
Buzău	0.78
Sălaj	0.77
Hunedoara	0.76
Tulcea	0.76
Caras-Severin	0.76
Vrancea	0.75
Vâlcea	0.74
Bacău	0.74
Mehedinți	0.73
Bistrița-Năsăud	0.73
Galați	0.72
Ialomița	0.72
Suceava	0.70
Teleorman	0.69
Călărași	0.69
Satu Mare	0.69
Iași	0.68
Maramureș	0.68
Arad	0.67
Olt	0.67
Bihor	0.66
Dolj	0.66
Constanta	0.66
Alba	0.66
Harghita	0.65
Dâmbovița	0.65
Mureș	0.63
Gorj	0.61
Giurgiu	0.61
Ilfov	0.60

Ialomița	0.28
Teleorman	0.24
Gorj	0.22
Ilfov	0.17
Sibiu	0.07
Cluj	0.05
Brașov	0.04

Argeș	0.58
Prahova	0.57
Timiș	0.55
Brașov	0.54
Cluj	0.51
Sibiu	0.49
Municipiul București	0.37

**ILLICIT TOBACCO TRADE PRESSURE: 2015
ROMANIA**

Vaslui	0.86
Hunedoara	0.77
Botoșani	0.77
Neamț	0.77
Sălaj	0.75
Caras-Severin	0.75
Călărași	0.75
Vâlcea	0.75
Brăila	0.74
Buzău	0.73
Tulcea	0.73
Covasna	0.73
Vrancea	0.72
Ialomița	0.72
Arad	0.71
Satu Mare	0.71
Teleorman	0.70
Mehedinți	0.70
Bihor	0.70
Suceava	0.69
Maramureș	0.68
Galați	0.67
Dolj	0.66
Olt	0.66
Bistrița-Năsăud	0.65
Iași	0.65

**ILLICIT TOBACCO TRADE PRESSURE: 2014
ROMANIA**

Caras-Severin	0.82
Brăila	0.80
Vaslui	0.79
Botoșani	0.77
Ilfov	0.76
Hunedoara	0.75
Mehedinți	0.75
Neamț	0.75
Buzău	0.74
Sălaj	0.72
Harghita	0.69
Suceava	0.65
Olt	0.65
Satu Mare	0.65
Arad	0.65
Bacău	0.64
Galați	0.64
Maramureș	0.63
Teleorman	0.63
Dolj	0.61
Bihor	0.60
Iași	0.58
Dâmbovița	0.56
Mureș	0.54
Constanța	0.52
Argeș	0.49

Bacău	0.63
Giurgiu	0.62
Timiș	0.62
Harghita	0.62
Constanta	0.62
Cluj	0.61
Brașov	0.59
Argeș	0.59
Prahova	0.58
Mureș	0.57
Alba	0.56
Gorj	0.56
Sibiu	0.48
Municipiul București	0.37
Dâmbovița	0.20
Ilfov	0.12

Sibiu	0.49
Timiș	0.48
Prahova	0.47
Cluj	0.42
Tulcea	0.40
Covasna	0.37
Vrancea	0.37
Vâlcea	0.28
Alba	0.25
Bistrița-Năsăud	0.24
Gorj	0.20
Ialomița	0.19
Giurgiu	0.18
Călărași	0.18
Municipiul București	0.17
Brașov	0.00

**ILLICIT TOBACCO TRADE PRESSURE: 2013
ROMANIA**

Vaslui	1.00
Botoșani	0.97
Mehedinți	0.96
Neamț	0.90
Caraș-Severin	0.87
Vâlcea	0.85
Brăila	0.82
Bacău	0.78
Olt	0.78
Sălaj	0.77
Harghita	0.77
Hunedoara	0.77
Suceava	0.76
Gorj	0.75
Buzău	0.73
Alba	0.70
Ilfov	0.69
Satu Mare	0.68
Iași	0.68



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Arad	0.68
Dolj	0.66
Galați	0.66
Teleorman	0.65
Maramureș	0.64
Bihor	0.60
Mureș	0.57
Dâmbovița	0.56
Sibiu	0.56
Constanta	0.52
Argeș	0.49
Covasna	0.48
Timiș	0.48
Brașov	0.46
Prahova	0.46
Cluj	0.45
Vrancea	0.40
Tulcea	0.37
Bistrița-Năsăud	0.28
Ialomița	0.24
Călărași	0.22
Giurgiu	0.15
Municipiul București	0.14