



Thank you for Smoking!

Rents of Big Tobacco in Switzerland

Andreas Kohler
Agroscope

10th FIW Research Conference “International Economics”
November 9 - 10, Vienna

Disclaimer: The views expressed in this paper are those of the authors and do not necessarily reflect those of Agroscope and the Federal Department of Economic Affairs, Education and Research.



Motivation

Background

- Swiss cigarette exports have more than **quadrupled** from 1998 to 2012
- EU cigarette exports have only doubled

Why has Switzerland been so successful in exporting cigarettes?

- Switzerland did **not** adopt newly reformed EU tobacco law in 2004 regulating maximum yield limits for cigarettes → regulatory differences

Anecdotal evidence

- ⇒ EU reforms tobacco law implementing maximum yield limits for **all** cigarettes produced in EU regardless of consumption
- ⇒ lobbying of Big Tobacco in Switzerland
- ⇒ Swiss parliament does not harmonize Swiss tobacco law with EU tobacco law allowing stronger cigarettes to be **exported**
- ⇒ creation of economic **rents** for Big Tobacco in Switzerland
- ⇒ securing **jobs** in rural parts of Switzerland and **tax revenues** for the Swiss government?



Research question and contribution

Research goal

- Quantify the value of rent for Big Tobacco measured by “abnormal” exports of cigarettes produced in Switzerland due to regulatory differences (EU tobacco law reform in 2004)

Contribution to literature on **non-tariff measures** (NTMs)

- differing maximum yield limits for cigarettes can be interpreted as NTM in the form of regulatory differences
- ⇒ effects of NTMs on **international trade**
- regulatory differences (NTM) create “abnormal” exports or economic rent for Big Tobacco
- ⇒ measuring economic **rent** of MNCs due to NTMs



Tobacco policy and reform: EU

The EU parliament passed **Directive 2001/37/EC** in May 2001 with the main goal of **reforming** and harmonizing EU member states laws on manufacturing and sale of tobacco products.

Article 3 of Directive 2001/37/EC concerned **maximum** yield limits, and was introduced sequentially:

1. From 1 January 2004, the yield of cigarettes marketed and manufactured in the Member States cannot exceed: 10 mg per cigarette of tar (T); 1 mg per cigarette for nicotine (N); 10 mg per cigarette for carbon monoxide (CO).
2. From 1 January 2005, cigarettes manufactured within and **exported** from the Member States may apply the yield limits above but have to do so by 1 January 2007.

This is also referred to as the 10-1-10 **TNCO** standard or ceiling.

TNCO ceilings are **controversial** from medical point of view:

- (i) TNCO emissions are measured in laboratory settings (different from actual smoking behavior)
- (ii) people might adjust their smoking behavior and smoke more cigarettes to keep nicotine intake constant



Tobacco policy and reform: Switzerland

Switzerland has only **partly** harmonized its tobacco policy with Article 3 of Directive 2001/37/EC:

1. The maximum yield of cigarettes sold in Switzerland cannot exceed the 10-1-10 TNCO ceiling as from 1 January 2004
2. Cigarettes produced in Switzerland and **exported** only need to meet the maximum yield limits of the destination market (if yield limits are in place)

Economic implications

- ▶ Big Tobacco can still produce **strong** cigarettes in Switzerland for the **export** market
- ▶ Strong cigarettes made in Switzerland are marketed as **premium brands** (product differentiation based on quality and origin)
- ▶ Big Tobacco may capture an economic **rent** in Switzerland in the form of exports that would otherwise no longer be possible
- ▶ Switzerland **economy** may benefit more than Big Tobacco by securing jobs in rural areas and retaining tax revenue



Tobacco industry: cigarette producers

Big Tobacco refers to five **multinational (tobacco) corporations** (MNCs) of which the following three produce **cigarettes** in Switzerland:

- ▶ British American Tobacco (BAT) employs 450 people in canton of Jura producing Lucky Strike and Parisienne
- ▶ Japan Tobacco Inc. (JTI) employs 1,300 people in canton of Lucerne producing Camel and Winston
- ▶ Philip Morris International (PMI) employs 3,000 people in Neuchâtel producing Marlboro and Chesterfield

Swiss cigarette market in 2015

- ▶ 9 billion cigarettes sold
- ▶ 28 billion cigarettes exported
- ▶ domestically produced tobacco used only 3.2 percent ⇒ not Swiss Agricultural Sector benefits

⇒ MNCs operating in **oligopolistic** markets

⇒ Big Tobacco **does not produce cigars** in Switzerland



Tobacco industry: cigar manufacturers and global trends

Two medium-sized international companies manufacture **cigars** in Switzerland:

- ▶ Burger Söhne AG employs 60 people in the canton of Ticino manufacturing Dannemann and Rössli cigars (production in Brazil, Nicaragua and Spain)
- ▶ Villiger Söhne AG employs 170 in canton of Lucerne manufacturing Rio 6 and Villiger Export cigars (production in Germany)

⇒ export-oriented companies operating in **oligopolistic** markets

⇒ cigar manufacturers **do not produce cigarettes** in Switzerland

⇒ cigar production and exports are **not** affected by Article 3 of Directive 2001/37/EC

Global environment and **trends** in anti-smoking laws and sentiments

- ▶ According to WHO, tobacco use is one of the main risk factors for a number of chronic diseases, including cancer, lung diseases, and cardiovascular diseases
- ▶ WHO views tobacco as a global epidemic fighting it with its Tobacco Free Initiative (TFI) advising member countries to issue warnings on the dangers of smoking, implement bans on advertising and increase taxes

⇒ cigarette and cigar smoking are viewed as equally harmful and subject to similar regulations and campaigns



Identification strategy (I)

To identify the effect of regulatory differences (Directive 2001/EC/37) on Swiss cigarette exports we use the following two strategies:

- ▶ Strategy I: compare Swiss cigarette exports to countries with **identical and different TNCO ceilings** than the EU after 2004
- ▶ Strategy II: compare **Swiss cigarette exports to cigar exports**, both to countries with different TNCO ceilings than the EU after 2004

These identification strategies rely on the key assumption that

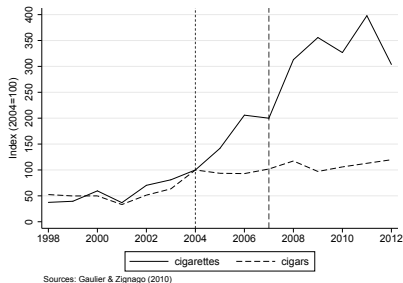
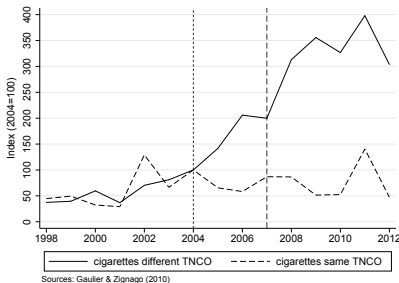
- ▶ comparison groups follow **common trend** before the introduction of Directive 2001/37/EC in the EU



Identification strategy (II)

Similar **trends** before 2004

- ▶ Strategy I: Swiss cigarette exports to countries with identical and different TNCO ceilings than the EU after 2004 evolve similar before 2004
- ▶ Strategy II: Swiss cigarette exports and Swiss cigar exports to countries with different TNCO ceilings than the EU after 2004 evolve similar before 2004





Data

We use data on Swiss cigarette (HS6 2402.20) and cigar (HS6 2402.10) exports to 185 countries from 1998 until 2012 provided by CEPII. Summary statistics highlight different **levels** before 2004.

	same TNCO	different TNCO	Difference
<u>Outcome</u>			
Swiss cigarette exports (in million USD)	3.75	0.70	3.05***
Swiss cigar exports (in million USD)		0.03	
Difference Swiss cigar to cigarette exports		-0.67***	
<u>Controls</u>			
<u>Market size and access</u>			
GDP per capita (constant 2010 USD)	30866	7603	23263***
Population (in millions)	25.8	33.9	-8.1
no EIA	0.10	0.92	-0.82***
PTA	0.03	0.02	0.01
FTA	0.87	0.06	0.82***
<u>Tobacco policy</u>			
total ad-valorem tax rate cigarettes	0.73	0.41	0.32***
price most sold cigarette brand (int. USD)	3.47	1.23	2.24***
<u>Smoking prevalence</u>			
smoking prevalence male (age-standardized rate)	0.39	0.40	-0.01
smoking prevalence female (age-standardized rate)	0.28	0.12	0.16***
N	24	161	

* $p < 0.1$, ** $p < 0.5$, *** $p < 0.01$

Sources: Gaulier and Zignago (2010), Wikipedia (2016) The World Bank (2016), Bergstrand and Baier (2016), World Health Organization (2016)



We estimate the effect of regulatory differences using the two identification strategies based on the following econometric models:

Identification strategy I

$$EXP_{it} = \alpha + \delta TNCO_{it} + \sum_k \beta_k CTRY_{ki} + \sum_s \gamma_s YEAR_{st} + X_{it}\theta + \varepsilon_{it}$$

where

- $TNCO$ is a dummy variable taking value 1 if country i has a different TNCO standard than the EU after 2004

Identification strategy II

$$EXP_{ijt} = \alpha + \delta CIG04_{jt} + \phi CIG_j + \sum_k \beta_k CTRY_{ki} + \sum_s \gamma_s YEAR_{st} + X_{it}\theta + \varepsilon_{ijt}$$

where

- $CIG04$ is a dummy variable taking value 1 if product j is cigarettes after 2004



Results: Identification strategy I

- Estimated rent between USD 1 million and USD 5.5 million, and statistically not significant

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TNCO	2.67 (1.81)	2.94 (1.94)	3.42 (2.38)	4.51 (3.10)	1.48 (2.75)	5.67 (3.45)	1.01 (1.31)
market size and access	no	yes	yes	yes	yes	yes	yes
tobacco policy	no	no	yes	yes	yes	yes	yes
smoking prevalence	no	no	no	yes	yes	yes	yes
country-specific time trends	no	no	no	no	yes	no	no
Observations	2775	2671	2580	1755	1755	120	1521
adjusted R^2	0.02	0.05	0.05	0.07	0.50	0.73	n.a.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: Clustered (on destination country) standard errors in parentheses. Controls include market size and access (GDP p.c., population, dummy for economic integration agreement), tobacco policy (total ad-valorem tax on cigarettes, price of most sold cigarette brand), smoking prevalence (age standardized rate of smoking adult males and females). Based on observations from OECD countries only, Model (6) uses propensity score matching (PSM) using the nearest neighbor method (without replacement) to construct treatment and control group matching on the outcome itself, market size and access, tobacco policy and smoking prevalence in the pre-treatment period before applying Model (4). Clustered standard errors in Model (6) are computed using bootstrap with 50 replications. Model (7) is a dynamic panel-data model including one lag of the dependent variable, which is estimated using the Arellano-Bond difference GMM one-step estimator. Model (7) uses 35 instruments, the p -value of the Arellano-Bond test for AR(2) in first-differences is 0.13, and the p -value for the Hansen J test of overidentification restrictions with 9 degrees of freedom is 0.24.

Sources: Gaulier and Zignago (2010), Wikipedia (2016) The World Bank (2016), Bergstrand and Baier (2016), World Health Organization (2016)



Results: Identification strategy II

- Estimated rent between USD 2.5 million and USD 4.3 million, and statistically significant

	(1)	(2)	(3)	(4)	(5)	(6)
CIG04	2.69*** (0.97)	2.55** (0.98)	2.61** (1.02)	3.78** (1.60)	3.78** (1.63)	4.30** (1.87)
market size and access	no	yes	yes	yes	yes	yes
tobacco policy	no	no	yes	yes	yes	yes
smoking prevalence	no	no	no	yes	yes	yes
country-specific time trends	no	no	no	no	yes	no
Observations	4830	4622	4440	2820	2820	2444
adjusted R^2	0.19	0.20	0.20	0.21	0.35	n.a.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: Clustered (on destination country) standard errors in parentheses. Controls include market size and access (GDP p.c., population, dummy for economic integration agreement), tobacco policy (total ad-valorem tax on cigarettes, price of most sold cigarette brand), smoking prevalence (age standardized rate of smoking adult males and females). Model (6) is a dynamic panel-data model including one lag of the dependent variable, which is estimated using the Arellano-Bond difference GMM one-step estimator. Model (6) uses 113 instruments, the p -value of the Arellano-Bond test for AR(2) in first-differences is 0.46, and the p -value for the Hansen J test of overidentification restrictions with 87 degrees of freedom is 0.31.

Sources: Gaulier and Zignago (2010), Wikipedia (2016) The World Bank (2016), Bergstrand and Baier (2016), World Health Organization (2016)



Conclusions

- NTM in form of regulatory differences: Switzerland does not adapt EU TNCO ceilings for domestically produced cigarettes that are consumed abroad
- We find evidence that these regulatory differences created substantial rents of about USD 2.5 million to USD 4.3 million on average for Big Tobacco in Switzerland
- Welfare analysis beyond this paper (private gains vs. social costs / global vs. local)
- Suggests that small regulatory differences can be relatively important in countries' competition for jobs and tax revenue (footloose MNCs)
- Highlights importance of global coordination in combating global (health) issues
- Policy advice: implications for economic policies? (global vs. local)

Thank you for smoking is the title of the 1994 satirical novel by Christopher Buckley about a tobacco lobbyist in the United States. In 2006, the book has been made into a film of the same name written and directed by Jason Reitman starring Aaron Eckhart.



15



Bergstrand, J. H. and Baier, S. L. (2016). NSF-Kellogg Institute Data Base on Economic Integration Agreements.

Gaulier, G. and Zignago, S. (2010). BACI: International Trade Database at the Product-Level. The 1994-2007 Version. Working Papers 2010-23, CEPII.

The World Bank (2016). World Development Indicators.

Wikipedia (2016). TNCO ceilings.

World Health Organization (2016). Global Health Observatory (GHO) database - Tobacco control.