



European Regulatory Science on Tobacco:
Policy implementation to reduce lung diseases

Affordability of Factory-made & Roll-your-own Cigarettes across Six European Countries from 2016 to 2018: Findings from the EUREST-PLUS ITC 6 European Country Survey

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Background

- Cigarettes are an inelastic economic good (elasticity: -0.3 to -0.5)
- Smokers respond to price increases (quit, reduce consumption)
- Prices vary across EU countries (e.g., €3.78 Hungary vs. €6.20 Germany)
- Prices **do not** reflect a smoker's ability to pay for cigarettes
- **Affordability**: price paid for cigarettes relative to incomes
- Rising incomes can offset the effects of cigarette tax increases
- Recent research from Bangladesh (Nargis et al., 2019):
 - Affordability varies by product type (low-price vs premium)
 - Affordability influences purchasing behaviours (product switching)

Study Objectives

**Overall Objective: To estimate affordability of FM and roll-your-own (RYO) cigarettes across 6 European countries from 2016 to 2018:
Germany, Greece, Hungary, Poland, Romania, Spain**

1. Estimate inflation-adjusted prices of a “pack” of 20 FM and RYO cigarettes
2. Test whether affordability differs:
 - Within country by product purchased in each survey year
 - Over time within country and product purchased

The EUREST-PLUS ITC Europe Surveys

- **Prospective longitudinal cohort survey**
 - Wave 1: June 2016 – September 2016
 - Wave 2: February 2018 – May 2018
- **Nationally representative samples of ~1000 adult smokers in each country**
- **Multi-stage probabilistic sampling design:**
 - Sampling strata: NUTS regions X degree of urbanization
 - Primary sampling units: 100 enumeration areas in each stratum
 - Face-to-face computer assisted interviewing (CAPI)
- **Post-stratification sampling weights**

Outcome Measures

- Price per cigarette and price per “pack” (20 cig, 0.75 grams loose RYO tobacco = 1 FM cigarette)

- Cigarette affordability = cigarette price to daily income ratio (CPDIR)

$$CPDIR = \frac{\textit{price per cigarette} * \textit{number of cigarettes per day}}{\textit{daily household income}} * 100$$

- CPDIR represents the share of household income spent on a daily dose of cigarettes
- Lower values of CPDIR indicate **greater** affordability

Statistical Analysis

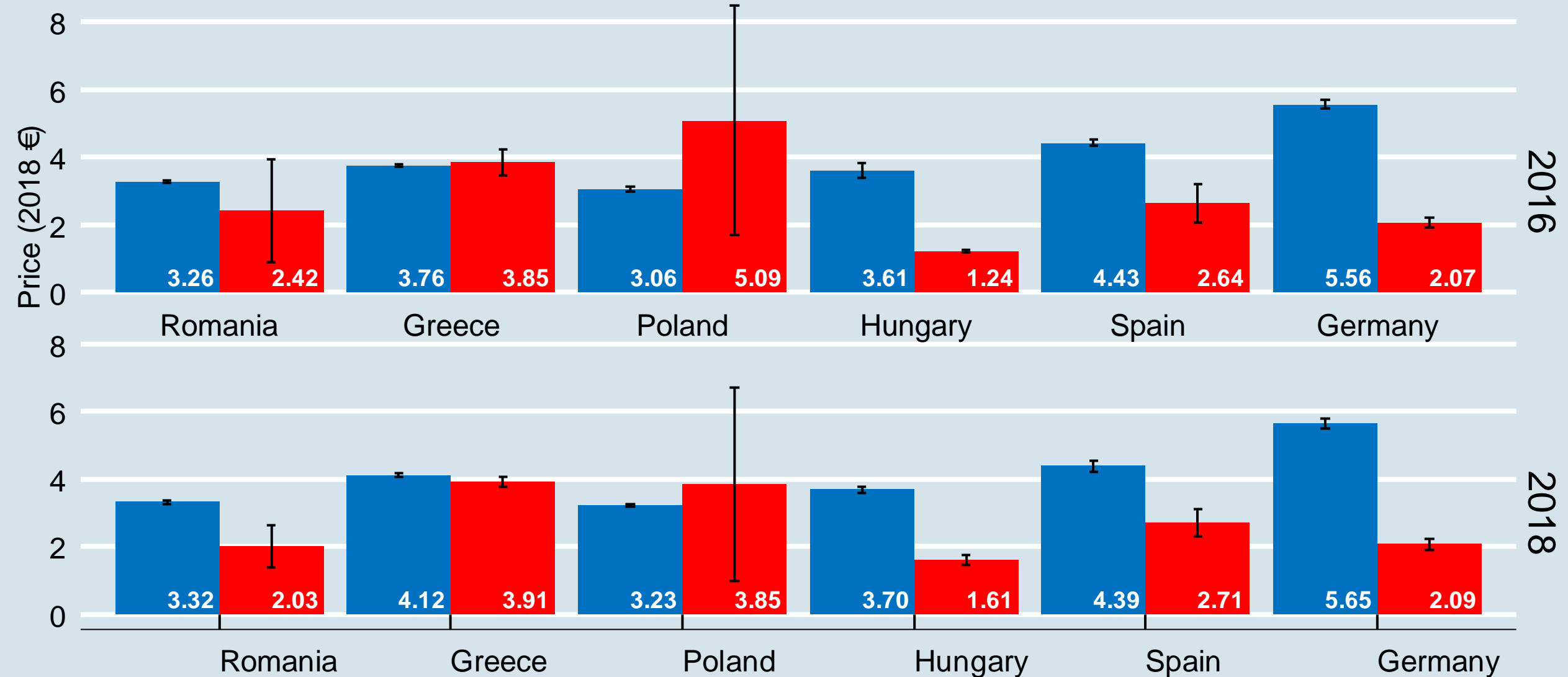
- **Analysis:** current smokers providing valid price and income data
- **Weighted linear generalized estimating equations (GEE)**
 - Sociodemographic (sex, age, urbanization, education)
 - Smoking status (daily vs non-daily)
 - Type of product last purchased (FM vs RYO)
- **Tested country X survey year X product interaction effect:**
 - Difference in affordability between products within country and wave
 - Change in affordability over time by product type within country

Sample Characteristics

	Germany (n=1169)	Greece (n=1262)	Hungary (n=1073)	Poland (n=999)	Romania (n=1331)	Spain (n=751)
% female	41.6	47.1	41.2	46.0	40.2	39.5
% age ≥ 40	<u>63.7</u>	61.4	57.1	60.6	<u>50.2</u>	59.5
% low income	34.4	21.7	20.6	21.8	<u>18.9</u>	<u>43.7</u>
% daily smoker	<u>88.0</u>	97.3	<u>98.9</u>	97.1	95.6	96.3
% exclusive RYO	9.4	27.0	<u>45.8</u>	8.6	<u>1.3</u>	19.1
Mean cigarettes/day						
Exclusive RYO	19.0	16.8	18.2	<u>20.5</u>	16.6	<u>12.8</u>
Both RYO + FM	18.2	<u>17.6</u>	18.6	<u>20.5</u>	19.4	18.6
Exclusive FM	<u>13.7</u>	<u>20.5</u>	14.0	15.7	16.3	15.6

Real self-reported price of 20 cigarettes (2018 €) by product

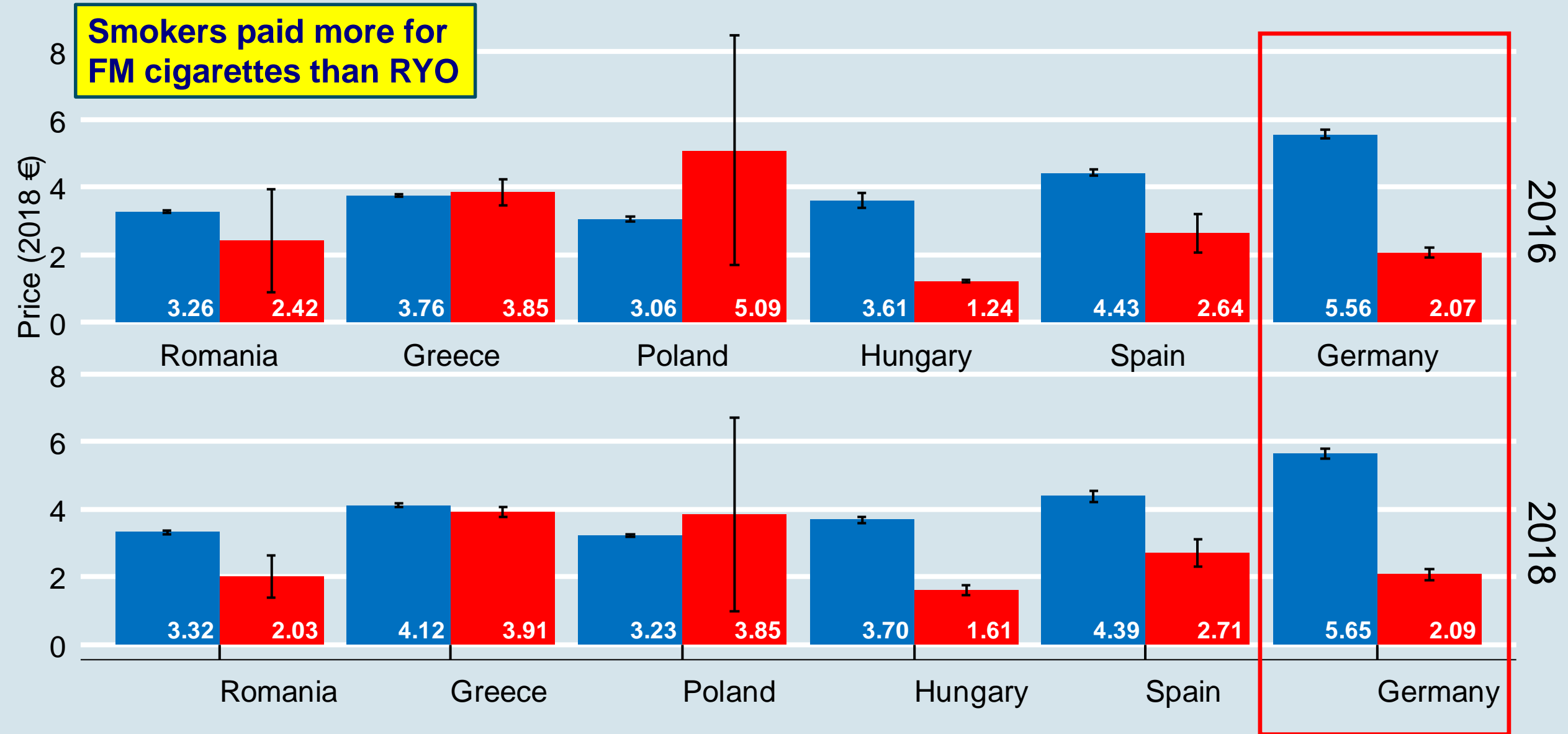
■ Factory-made ■ Roll-your-own



Real self-reported price of 20 cigarettes (2018 €) by product

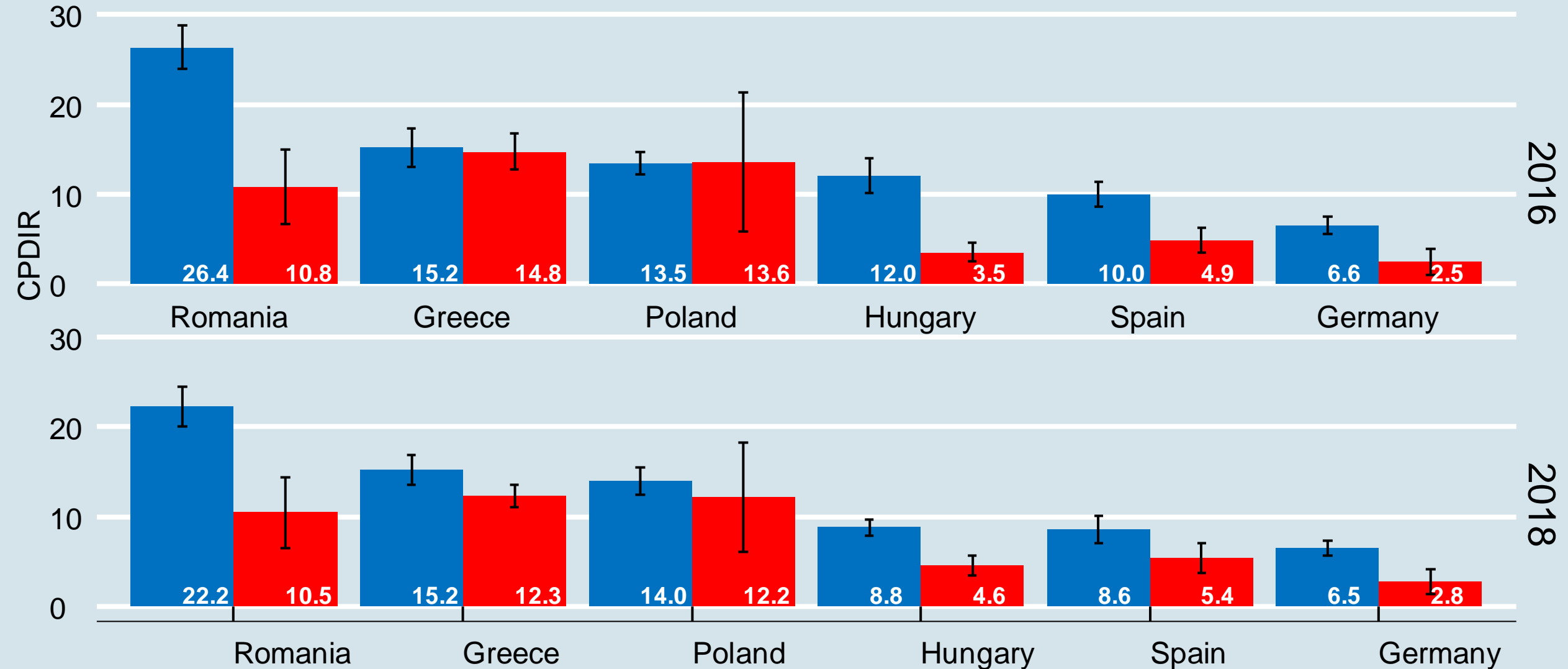
■ Factory-made ■ Roll-your-own

Smokers paid more for FM cigarettes than RYO



Cigarette affordability by product

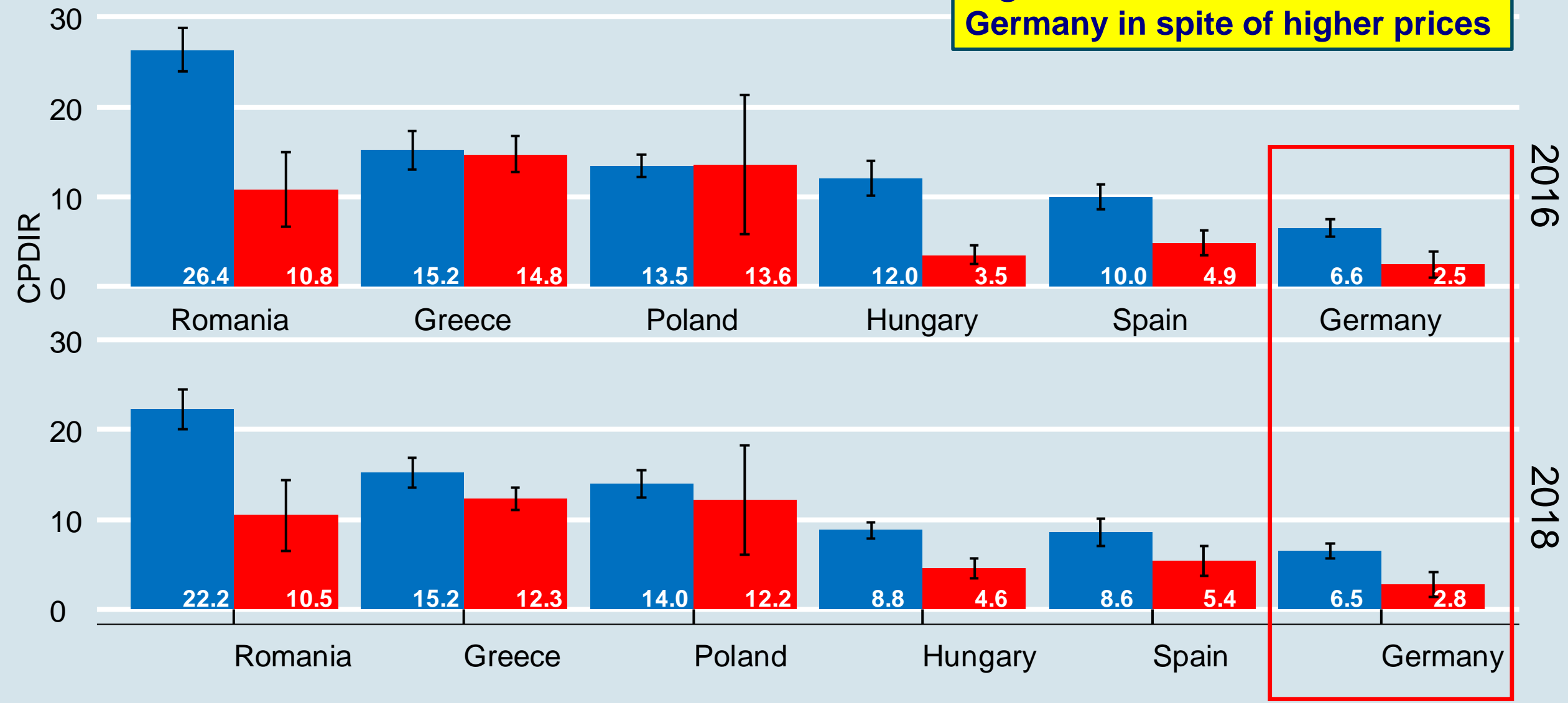
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Cigarette affordability by product

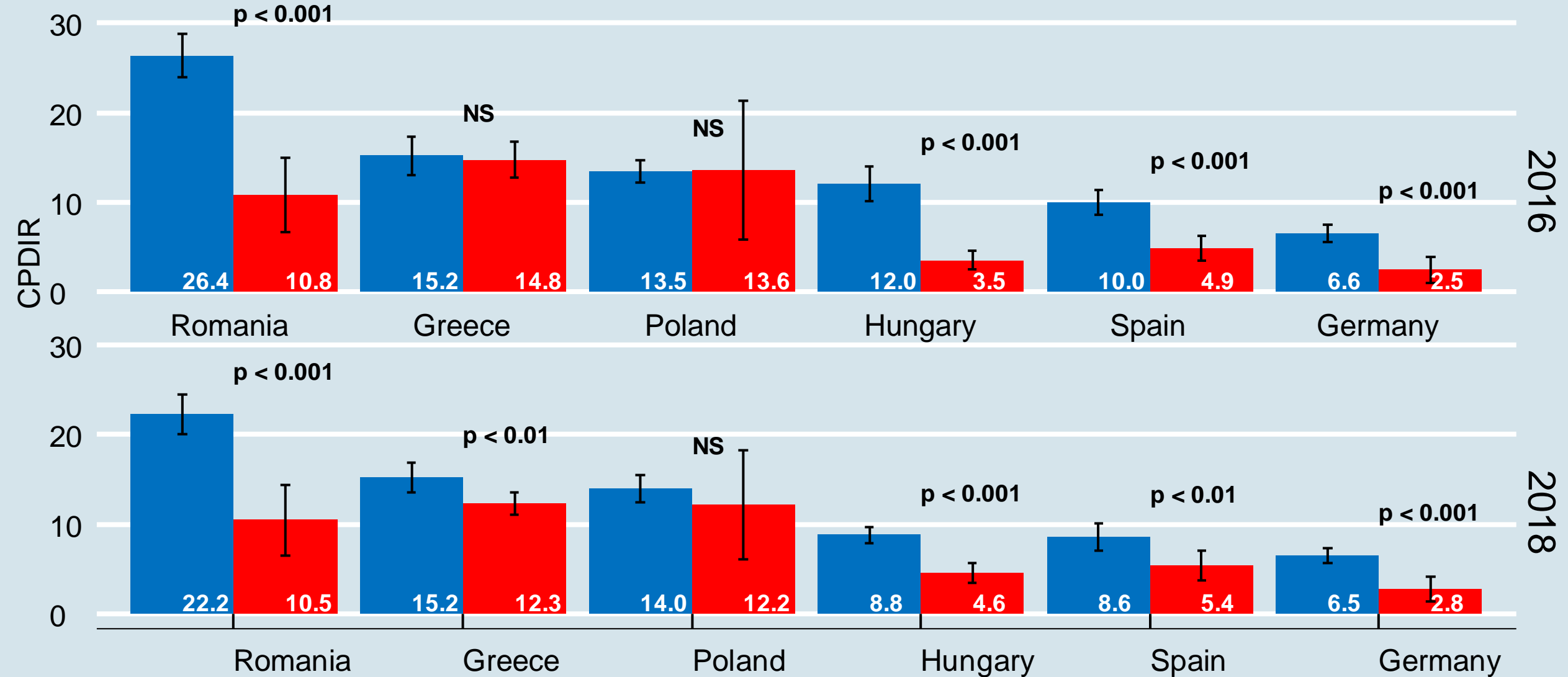
■ Factory-made ■ Roll-your-own

Cigarettes are more affordable in Germany in spite of higher prices



Cigarette affordability by product

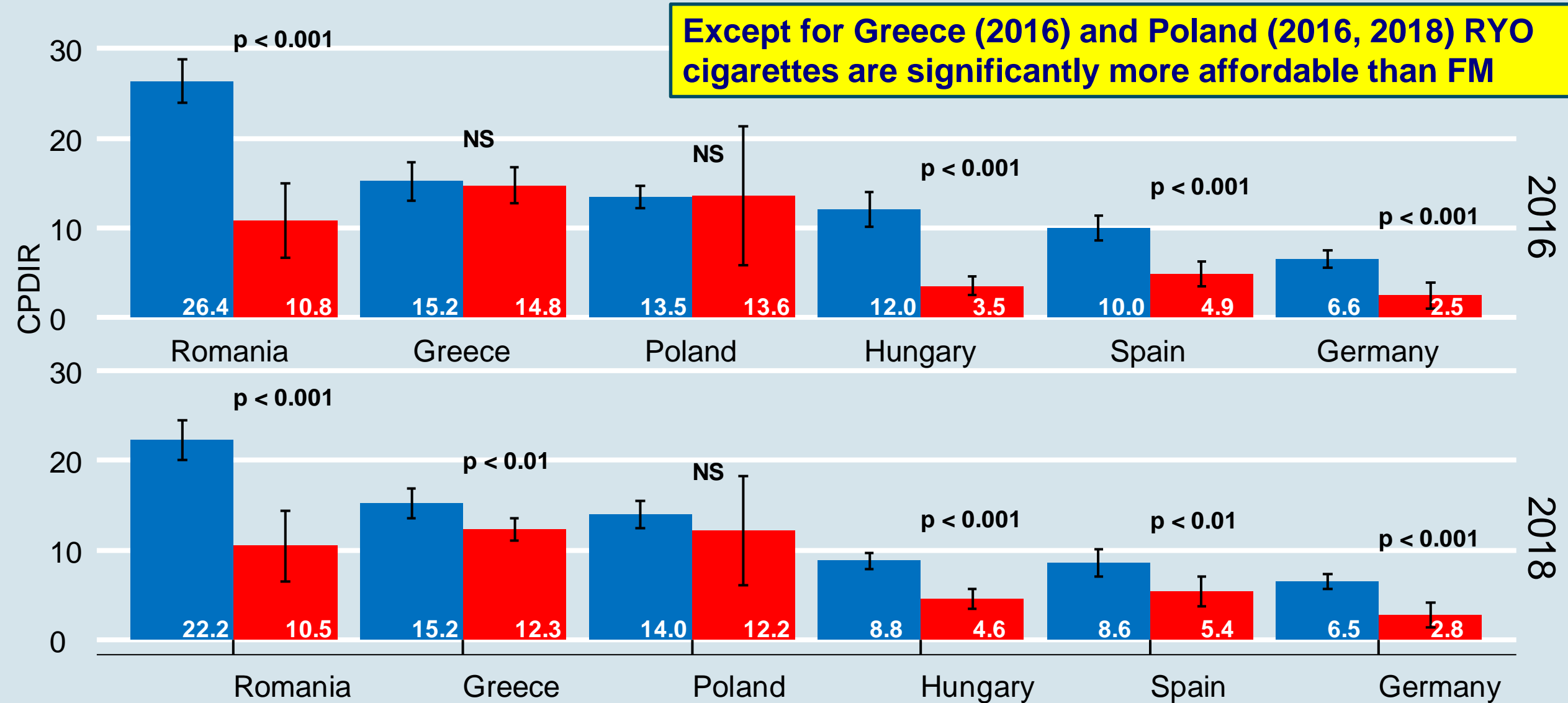
■ Factory-made ■ Roll-your-own



Cigarette affordability by product

■ Factory-made ■ Roll-your-own

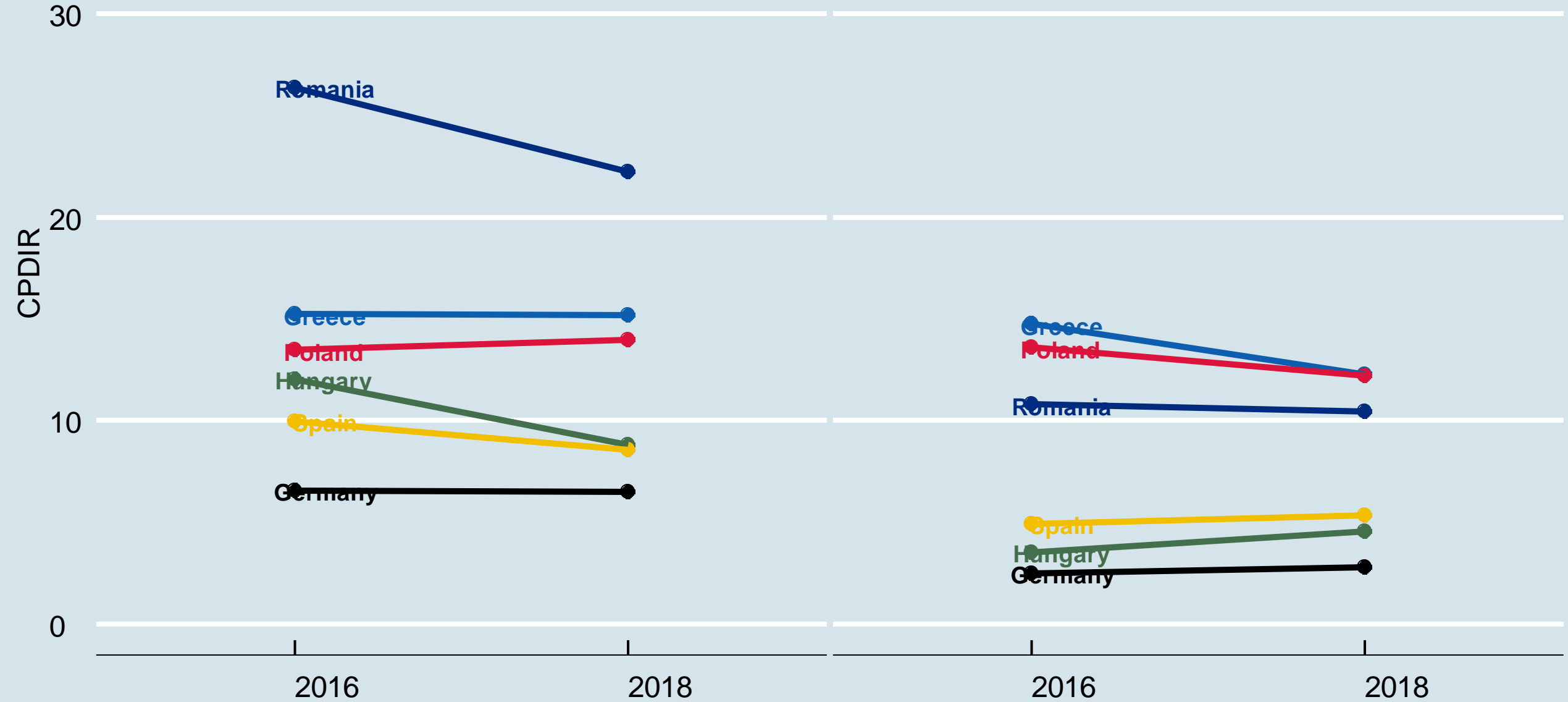
Except for Greece (2016) and Poland (2016, 2018) RYO cigarettes are significantly more affordable than FM



Little change in cigarette affordability over time

Factory-made

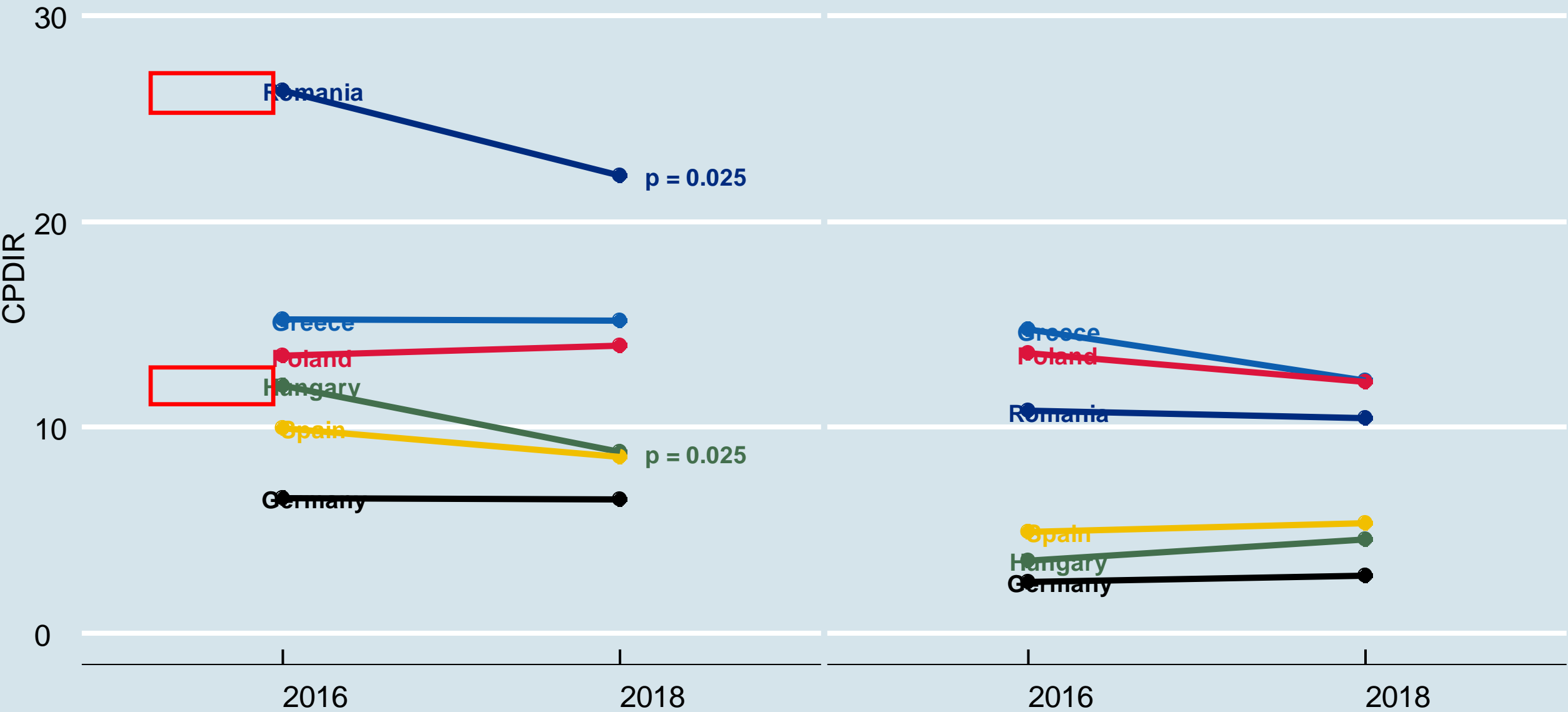
Roll-your-own



From 2016 to 2018, FM cigarettes became more affordable in Romania and Hungary

Factory-made

Roll-your-own



Summary

- RYO cigarettes were significantly more affordable than FM cigarettes except in Greece (2016) and Poland (2016 and 2018)
- German RYO smokers spent the smallest share of their incomes on cigarettes; Romanian FM smokers spent the largest share
- RYO cigarettes did not change in affordability in any of the 6 countries
- FM cigarettes became significantly more affordable by 2018 in Romania and Hungary → product switching?
- Limitations:
 - Smokers not reporting income were excluded (pattern of missingness was not MAR)
 - Simultaneity of product choice and affordability

Conclusions

- RYO cigarettes are significantly more affordable than FM cigarettes in Germany, Greece, Hungary, Romania, and Spain
- Affordability of RYO cigarettes did not change from 2016 to 2018
- Implications for tax policy:
 - Increase taxes on loose tobacco
 - Provides fewer options for price-sensitive smokers
 - Prevents product switching to minimize costs
 - Encourages smoking cessation in response to tax increases

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