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Smoking Bans in
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Effect of smoking
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Social Capital and Smoking

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University of Padova
Joint Research Centre, EC

4 October 2012

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- OBJECTIVE OF THE PAPER

- Testing on specific channel underlying the relationship between social capital and smoking behavior

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- OBJECTIVE OF THE PAPER

- Testing on specific channel underlying the relationship between social capital and smoking behavior
 - *Assumption: social capital strenghtens the compliance to anti-smoking regulations*

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- OBJECTIVE OF THE PAPER

- Testing on specific channel underlying the relationship between social capital and smoking behavior

- *Assumption:* social capital strenghtens the compliance to anti-smoking regulations

- Empirical analysis based on German data

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- OBJECTIVE OF THE PAPER

- Testing on specific channel underlying the relationship between social capital and smoking behavior
 - *Assumption:* social capital strenghtens the compliance to anti-smoking regulations
- Empirical analysis based on German data
 - *Idea:* compare smoking behaviors before and after the implementation of smoking bans in 2007/2008

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 - Effect of the smoking ban on smoking prevalence and intensity of consumption

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- Effect of the smoking ban on smoking prevalence and intensity of consumption
- Effect of social capital on enforcement of smoking bans

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- Effect of social capital on enforcement of smoking bans

- **Conclusion**

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- **Tabacco smoke: major issue for public health**

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- **Tabacco smoke: major issue for public health**
 - Exposure to tobacco smoke: "passive smoking"

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- **Tabacco smoke: major issue for public health**
 - Exposure to tobacco smoke: "passive smoking"
- **Expected effect of a smoking ban:**

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- **Tabacco smoke: major issue for public health**
 - Exposure to tobacco smoke: "passive smoking"
- **Expected effect of a smoking ban:**
 - Reduction in smoking prevalence and smoking intensity

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- **Tabacco smoke: major issue for public health**
 - Exposure to tobacco smoke: "passive smoking"
- **Expected effect of a smoking ban:**
 - Reduction in smoking prevalence and smoking intensity
 - **Potentially also a "displacement effect"**

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- **Tabacco smoke: major issue for public health**
 - Exposure to tobacco smoke: "passive smoking"
- **Expected effect of a smoking ban:**
 - Reduction in smoking prevalence and smoking intensity
 - Potentially also a "displacement effect"
- **Past 10 years: almost all European countries have implemented comprehensive smoking bans:**

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- **Tabacco smoke: major issue for public health**
 - Exposure to tobacco smoke: "passive smoking"
- **Expected effect of a smoking ban:**
 - Reduction in smoking prevalence and smoking intensity
 - Potentially also a "displacement effect"
- Past 10 years: almost **all European countries** have implemented comprehensive smoking bans:
 - 2004: Ireland, 2005: Italy and Sweden

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- Past 10 years: almost **all European countries** have implemented comprehensive smoking bans:
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 - 2006: Belgium, Spain, Luxembourg

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- **Tabacco smoke: major issue for public health**
 - Exposure to tobacco smoke: "passive smoking"
- **Expected effect of a smoking ban:**
 - Reduction in smoking prevalence and smoking intensity
 - Potentially also a "displacement effect"
- Past 10 years: almost **all European countries** have implemented comprehensive smoking bans:
 - 2004: Ireland, 2005: Italy and Sweden
 - 2006: Belgium, Spain, Luxembourg
 - 2007/2008 : UK, Finland, Denmark, France, **Germany**, Netherlands, Portugal

Effect of smoking bans on health and smoking behaviors

- **Origa and Lucifora (2010)** estimate the effect of smoking bans in European workplaces

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- **Origa and Lucifora (2010)** estimate the effect of smoking bans in European workplaces
 - *Diff-in-Diff estimates:* use cross-country variations in the timing of the introduction of smoking bans

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- **Origa and Lucifora (2010)** estimate the effect of smoking bans in European workplaces
 - *Diff-in-Diff estimates*: use cross-country variations in the timing of the introduction of smoking bans
 - **Results**: smoking bans have had a significant effect on perceived health

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 - *Results*: smoking bans have had a significant effect on perceived health
- **Jones et al (2011)** evaluate the effect of smoking bans in the UK

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- **Origa and Lucifora (2010)** estimate the effect of smoking bans in European workplaces
 - *Diff-in-Diff estimates*: use cross-country variations in the timing of the introduction of smoking bans
 - *Results*: smoking bans have had a significant effect on perceived health
- **Jones et al (2011)** evaluate the effect of smoking bans in the UK
 - *Diff-in-Diff estimates*: use the variation in the timing of the implementation of the smoking ban between England and Scotland

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 - *Results*: smoking bans have had a significant effect on perceived health
- **Jones et al (2011)** evaluate the effect of smoking bans in the UK
 - *Diff-in-Diff estimates*: use the variation in the timing of the implementation of the smoking ban between England and Scotland
 - *Results*: no effect of the smoking ban on smoking prevalence but reduction in the daily consumption of cigarettes for some sub-groups (i.e. male heavy smokers, young people)

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 - *Results*: no effect of the smoking ban on smoking prevalence but reduction in the daily consumption of cigarettes for some sub-groups (i.e. male heavy smokers, young people)
- **Anger et al (2011)** assess the effect of smoking bans in Germany

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 - *Diff-in-Diff estimates*: use cross-country variations in the timing of the introduction of smoking bans
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- **Anger et al (2011)** assess the effect of smoking bans in Germany
 - *Diff-in-Diff estimates*: rely on variations across German States in the timing of the implementation of the smoking ban

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 - *Results*: no effect of the smoking ban on smoking prevalence but reduction in the daily consumption of cigarettes for some sub-groups (i.e. male heavy smokers, young people)
- **Anger et al (2011)** assess the effect of smoking bans in Germany
 - *Diff-in-Diff estimates*: rely on variations across German States in the timing of the implementation of the smoking ban
 - *Results*: no impact of the smoking on general smoking prevalence.

Social capital and health-related behaviors

- **Social capital expected to reduce smoking prevalence and intensity:**

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- **Social capital expected to reduce smoking prevalence and intensity:**
 - SC promotes information channels spreading ideas about the detrimental effect of tobacco

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- **Social capital expected to reduce smoking prevalence and intensity:**
 - SC promotes information channels spreading ideas about the detrimental effect of tobacco
 - SC raises trust in public/governmental institutions/doctors in charge of public health campaigns

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- **Social capital expected to reduce smoking prevalence and intensity:**
 - SC promotes information channels spreading ideas about the detrimental effect of tobacco
 - SC raises trust in public/governmental institutions/doctors in charge of public health campaigns
 - SC, understood as **civic capital** (Guiso et al, 2010): more civic capital associated with more obedience to regulations (value the social positive effect of such a behavior)

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 - SC raises trust in public/governmental institutions/doctors in charge of public health campaigns
 - SC, understood as **civic capital** (Guiso et al, 2010): more civic capital associated with more obedience to regulations (value the social positive effect of such a behavior)
- Various studies (Brown et al, 2011, Tampubolon et al, 2011, Li and Delva, 2011) **confirm the negative association between SC and smoking behaviors**

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- Various studies (Brown et al, 2011, Tampubolon et al, 2011, Li and Delva, 2011) **confirm the negative association between SC and smoking behaviors**
 - Endogeneity of social capital : cautious needed before giving a causal interpretation to such findings

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 - SC, understood as **civic capital** (Guiso et al, 2010): more civic capital associated with more obedience to regulations (value the social positive effect of such a behavior)
- Various studies (Brown et al, 2011, Tampubolon et al, 2011, Li and Delva, 2011) **confirm the negative association between SC and smoking behaviors**
 - Endogeneity of social capital : cautious needed before giving a causal interpretation to such findings
 - **When endogeneity taken into account through IV estimates, validity of exclusion restrictions not always convincing**

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- **With respect to the litterature on smoking ban:**

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- **With respect to the litterature on smoking ban:**
 - Employ a **natural experiment** to assess the effect of smoking bans on smoking behaviors

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- **With respect to the litterature on smoking ban:**
 - Employ a **natural experiment** to assess the effect of smoking bans on smoking behaviors
- **With respect to the litterature on social capital and health:**

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- **With respect to the litterature on smoking ban:**
 - Employ a **natural experiment** to assess the effect of smoking bans on smoking behaviors
- **With respect to the litterature on social capital and health:**
 - Test one specific channel that might underly the negative relationship between social capital and smoking behaviors

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- **With respect to the litterature on smoking ban:**
 - Employ a **natural experiment** to assess the effect of smoking bans on smoking behaviors
- **With respect to the litterature on social capital and health:**
 - Test one specific channel that might underly the negative relationship between social capital and smoking behaviors
- **SC strenghtens the compliance to an-smoking regulations**

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- **STEP 1: Identifying the causal effect of smoking ban on smoking behaviors using a proper identification strategy**

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- STEP 1: Identifying the causal effect of smoking ban on smoking behaviors using a proper identification strategy
- STEP 2: Test if the magnitude of the effect varies with the level of social capital

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- **Smoking bans introduced at different times in different German States:**
 - between August 2007 and July 2008

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- **Smoking bans introduced at different times in different German States:**
 - between August 2007 and July 2008
- **Data:** German Socio Economic Panel (SOEP):

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- **Smoking bans introduced at different times in different German States:**
 - between August 2007 and July 2008
- **Data:** German Socio Economic Panel (SOEP):
 - Includes information on social capital, smoking behaviors, State of residence and day of the interview

Estimation procedure: step 1

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Empirical results

- **Smoking bans introduced at different times in different German States:**
 - between August 2007 and July 2008
- **Data:** German Socio Economic Panel (SOEP):
 - Includes information on social capital, smoking behaviors, State of residence and day of the interview
 - Interviews take place between February and October

Estimation procedure: step 1

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- **Smoking bans introduced at different times in different German States:**
 - between August 2007 and July 2008
- **Data:** German Socio Economic Panel (SOEP):
 - Includes information on social capital, smoking behaviors, State of residence and day of the interview
 - Interviews take place between February and October
 - Use of the 2006 and 2008 waves

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- **Identification strategy:** individuals interviewed

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- **Identification strategy:** individuals interviewed

- BEFORE the introduction of the smoking ban are not treated ("CONTROL GROUP")

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- **Identification strategy:** individuals interviewed
 - BEFORE the introduction of the smoking ban are not treated ("CONTROL GROUP")
 - AFTER the introduction of the smoking ban are treated ("TREATMENT GROUP")

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- **Identification strategy:** individuals interviewed
 - BEFORE the introduction of the smoking ban are not treated ("CONTROL GROUP")
 - AFTER the introduction of the smoking ban are treated ("TREATMENT GROUP")
 - Assignment to the both groups is random: only depends on the date of the interview = **natural experiment**

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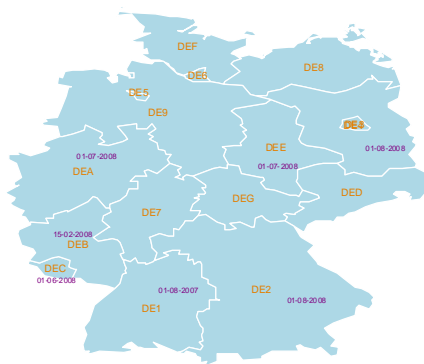
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Empirical results

- **Identification strategy:** individuals interviewed
 - BEFORE the introduction of the smoking ban are not treated ("CONTROL GROUP")
 - AFTER the introduction of the smoking ban are treated ("TREATMENT GROUP")
 - Assignment to the both groups is random: only depends on the date of the interview = **natural experiment**
 - Different from the identification strategy used in the papers reviewed above

Estimation procedure: step 1

- The ban took place between February and October 2008 (time period of the interviews) in 9 out of the 16 States and in 2 States the post-ban sample is very small



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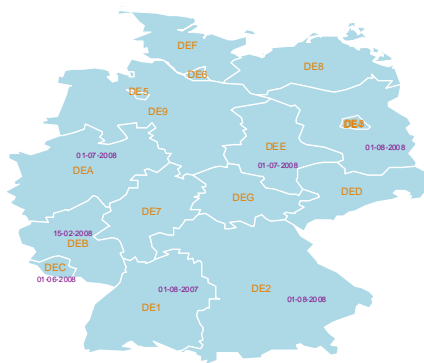
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Estimation procedure: step 1

- The ban took place between February and October 2008 (time period of the interviews) in 9 out of the 16 States and in 2 States the post-ban sample is very small
 - Empirical estimates thus restricted to 7 states: DEA DEB DEC DE3 DE4 DEE DEG



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- **Estimate a simple-difference model:**

$$Y_{is1} = \alpha_0 + \alpha_1 BAN_{is1} + \beta Y_{is0} + \delta X_{is} + \epsilon_{is}$$

where Y_{is1} is the smoking behavior of the individual i residing in state s in 2008

- **Estimate a simple-difference model:**

$$Y_{is1} = \alpha_0 + \alpha_1 BAN_{is1} + \beta Y_{is0} + \delta X_{is} + \epsilon_{is}$$

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- X_{is} includes individual health conditions, age, education, season dummies and **state dummies**

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- **Smoking behavior: 2 indicators**

- **Estimate a simple-difference model:**

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- **Smoking behavior: 2 indicators**
 - **Smoker dummy: yes/no**

- **Estimate a simple-difference model:**

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- X_{is} includes individual health conditions, age, education, season dummies and **state dummies**
- **Smoking behavior: 2 indicators**
 - Smoker dummy: yes/no
 - For smokers: daily consumption of cigarettes (number of multiples of 5 cigarettes)

Estimation procedure: step 1

- Validity of the estimation rests on **random assignment** to the treated and control groups within States s (and condition on the other covariates)

	Diff pre-post ban	
	Males	Females
Lag Smoke	0.033	-0.029
Age	-0.965	0.181
Education	-0.446*	-0.121
Immigrant	-0.001	-0.008
Employed	0.012	-0.033
Very good health	0.056**	0.015
Good health	-0.051	-0.058
Health Satisfactory	-0.018	0.008
Poor health	0.011	0.031
Bad health	0.001	0.003
Trust	0.06	0.11**
Trust I	-0.00	-0.03*

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Estimation procedure: step 1

- Validity of the estimation rests on **random assignment** to the treated and control groups within States s (and condition on the other covariates)
 - we test this assumption: "balance property"

	Diff pre-post ban	
	Males	Females
Lag Smoke	0.033	-0.029
Age	-0.965	0.181
Education	-0.446*	-0.121
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- **Does the effect of the smoking ban varies with the individual level of social capital?**

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Estimation procedure: step 2

- Does the effect of the smoking ban varies with the individual level of social capital?
- $$Y_{is1} = \alpha_0 + \alpha_1 BAN_{is1} + \alpha_2 BAN_{is1} * SC_{is1} + \alpha_3 SC_{is1} + \beta Y_{is0} + \delta X_{is} + \epsilon_{is}$$

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- Does the effect of the smoking ban varies with the individual level of social capital?
- $Y_{is1} = \alpha_0 + \alpha_1 BAN_{is1} + \alpha_2 BAN_{is1} * SC_{is1} + \alpha_3 SC_{is1} + \beta Y_{is0} + \delta X_{is} + \epsilon_{is}$
- **Marginal effect of social capital:** $\alpha_1 + \alpha_2 SC_{is1}$

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- **Does the effect of the smoking ban varies with the individual level of social capital?**
- $Y_{is1} = \alpha_0 + \alpha_1 BAN_{is1} + \alpha_2 BAN_{is1} * SC_{is1} + \alpha_3 SC_{is1} + \beta Y_{is0} + \delta X_{is} + \epsilon_{is}$
- **Marginal effect of social capital:** $\alpha_1 + \alpha_2 SC_{is1}$
 - Larger for individuals rich of social capital if α_1 and α_2 are negative

Estimation procedure: step 2

- **Does the effect of the smoking ban varies with the individual level of social capital?**
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 - Larger for individuals rich of social capital if α_1 and α_2 are negative
- **Indicators of social capital**

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- **Indicators of social capital**
 - **Trust dummy** = 1 if individuals fully/slightly agree that "on the whole one can trust people"

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 - **Trust index** based on the first principal component of 3 items

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- **Indicators of social capital**
 - **Trust dummy** = 1 if individuals fully/slightly agree that "on the whole one can trust people"
 - **Trust index** based on the first principal component of 3 items
 - **Volunteer dummy:** 1 if individuals take part in honorary office participation in clubs, associations or social services at least once a month

Pre-ban and post-ban samples by state and gender

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Federal States	Males		Females	
	Pre-ban	Post-ban	Pre-ban	Post-ban
DEA North-Rhine-West.	1,557	112	1713	130
DEB Rhineland – Palatinate	58	294	67	362
DEC Saarland	85	6	104	4
DE3 Berlin	280	29	332	33
DE4 Brandenburg	373	20	411	20
DEE Saxony-Anhalt	372	20	405	16
DEG Thuringia	407	16	427	20
Total	3132	497	3459	585

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	Males	Females	Former smokers		Males
			Males	Females	by age
BAN	-0.042*	0.028	-0.136***	0.026	-0.039*
	(0.023)	(0.022)	(0.048)	(0.064)	(0.023)
BAN*young					-0.136
					(0.091)
young					0.005
					(0.047)
Obs	3,249	3,655	1,059	998	3,249

Effect of the smoking ban on smoking intensity

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	Males	Females	Males by age
	Former smokers	Former smokers	Former smoker
Ban	-0.211** (0.084)	-0.105 (0.10)	-0.208** (0.083)
Ban*Young			-0.309 (0.421)
Young			-0.161 (0.135)
Obs	947	967	947

Social capital and smoking ban on smoking prevalence

Sample of Males

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		All	Former Smokers			
Ban	-0.003	0.014	-0.035	-0.080	-0.103	-0.122**
Ban*trust	-0.064**			-0.094		
Trust	0.021*			0.021		
Ban*trust In		-0.124			-0.084	
Trust In		0.061**			0.070	
Ban*Vol			-0.036			-0.108
Vol			-0.001			0.035
Obs	3242	3,237	3,244	1,057	1,056	1,057
$\alpha_1 + \alpha_2 SC$	-0.07***	-0.11**	-0.07**	-0.17***	-0.19*	-0.23**

Social capital and smoking ban on smoking intensity (half packs)

Sample of males

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		All		Former Smokers		
Ban	0.005	0.48**	-0.25*	-0.06	0.07	-0.20**
Ban*trust	-0.48***			-0.26**		
trust	0.045			0.01		
Ban* Trust I		-1.72***			-0.67***	
Trust I		0.254			0.056	
Ban*Vol			-0.049			-0.113
Vol			-0.20***			-0.034
Obs	3,113	3,108	3,115	945	944	945
$\alpha_1 + \alpha_2 SC$	-0.5***	-1.2***	-0.30	-0.3***	-0.6***	-0.3**

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- Effect of the ban only significant for males
- Social capital as measured by trust mediates the impact of the smoking ban on smoking behaviors

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- Effect of the ban only significant for males
- Social capital as measured by trust mediates the impact of the smoking ban on smoking behaviors
 - effect of the ban nil among men poor in SC

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Empirical results

- Effect of the ban only significant for males
- Social capital as measured by trust mediates the impact of the smoking ban on smoking behaviors
 - effect of the ban nil among men poor in SC
 - substantial impact of the ban both in terms of smoking prevalence and intensity among the most trustful individuals

Summary Statistics

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State	Prop of smokers %	Cig per day p. smoker	Trust %	Trust Index	Volunteer %
North-R-W.	29.2	16	62.1	0.46	17.7
Rhineland/P	26.9	16.9	60.8	0.46	18.7
Saarland	21.6	17.7	60.9	0.44	21.7
Berlin	32.2	14.5	60.5	0.48	12.9
Branden.	27.4	14.1	55	0.42	14.5
Saxony-An.	30.7	13.7	53.1	0.42	12.8
Thuringia	25.1	13.0	56.9	0.44	16.1