Long-Run Consequences of Temporary Policies: Tastes and Mortality

Lorenz Kueng[1]   and   Evgeny Yakovlev[2]

[1]Northwestern University and NBER

[2]New Economic School

Can restricting certain products affect long-run outcomes?

- ▶ Important for policy makers
  - ▶ preferences can be manipulated by public policies
  - ▶ preference changes affect important economic outcomes, including life expectancy

- ▶ Important for academics
  - ▶ impact evaluations that focus on short-run effects would miss substantial part of total effect

To answer this question we

- ▶ use two quasi-experiments that changed access to certain goods

- ▶ show policies affect relative preferences in the long-run

- ▶ show preference changes lead to large changes in mortality

Overview of Main Argument

A. Two experiments that changed product availability

    1. temporary prohibition 1985-91
       ▶ affects urban consumers relatively more $\Rightarrow$ diff-in-diff

    2. supply shock of previously rationed goods after Soviet Union
       ▶ large shock to beer market
       ▶ exotic fruits, chocolate, etc. $\Rightarrow$ external validity

B. Relate <u>relative</u> alcohol preferences to differences in mortality

C. Combine (A) & (B) to estimate long-run effect of policy

    ▶ *relative* preference changes explain 55% of recent decline in male mortality
    ▶ *level* of alcohol explains additional 15%
    ▶ going forward, we simulate a further decline in male mortality
       ▶ 25% over next 20 years
       ▶ 50% in new long-run steady state

Overview of Main Argument (cont.)

D. To relate our results to previous literature, we also implement a research design based on migrants

- ▶ we find similar results: migrants preferences are well predicted by behavior in place of origin

- ▶ advantage of our research design

  1. product restrictions are policy instruments, forced migration typically not

  2. we can use our research design to estimate at what age preferences form ("sensitive years")

  3. migrants might not represent general population

Outline

1. Data

2. 1ˢᵗ Experiment: Anti-Alcohol Prohibition Campaign

3. 2ⁿᵈ Experiment: Collapse of the Soviet Union

4. Alcohol Preferences and Mortality

5. Extensions (if time)
   ▶ Long-Run Preference vs. Age Effects
     (ie. "Stepping-Stone/Gateway" Effects)
   ▶ Migrants Research Design
   ▶ Long-Run Preferences for Non-Alcoholic Goods

6. Conclusion

Data

Russian Longitudinal Monitoring Survey (RLMS)

- ▶ panel with 4,000+ households per year from 1994 to 2011

- ▶ *individual* data on alcohol *consumption* (ie. quantities consumed, not expenditures) from survey's health module

    - ▶ no issue with preference aggregation within household

    - ▶ since we estimate *long-run* effects of past shocks, we can drop under-age individuals (age< 18)

    - ▶ reasonable for measuring adult mortality (Denisova 2010), although small sample

    - ▶ focus on working-age adults to deal with right censoring

- ▶ following previous literature we use consumption shares to avoid sensitivity to extreme outcomes

## Men and women have different preferences for alcohol

$\Rightarrow$ important to split analysis by gender

	Males		Females	
	Mean	St.Dev.	Mean	St.Dev.
Share of vodka (incl. home-made)	**61.51**	38.48	**38.54**	43.18
Share of beer (incl. home-made)	**29.32**	35.36	**22.65**	35.45
Share of wine	7.37	20.86	**35.69**	42.27
Share of other alcohol	1.81	10.87	3.13	15.18

1ˢᵗ Experiment: **Gorbachev's Anti-Alcohol Campaign**

- Temporary prohibition period 1985-91

- Restriction of alcohol production and distribution
    - very effective in a planned Soviet economy
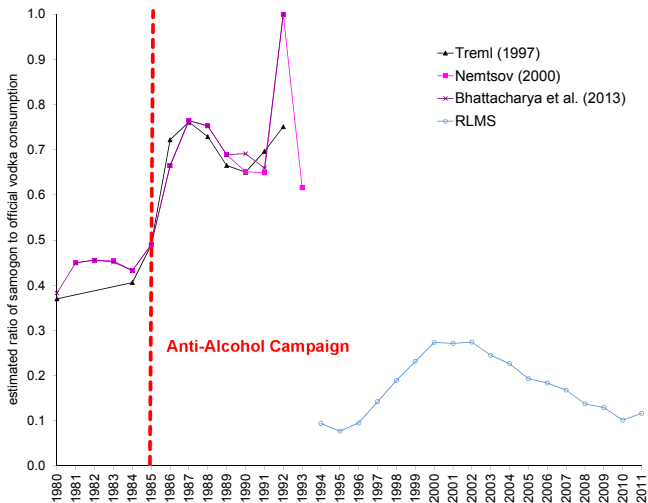   - dramatic fall in official sales of alcohol

Sales of Official Alcohol
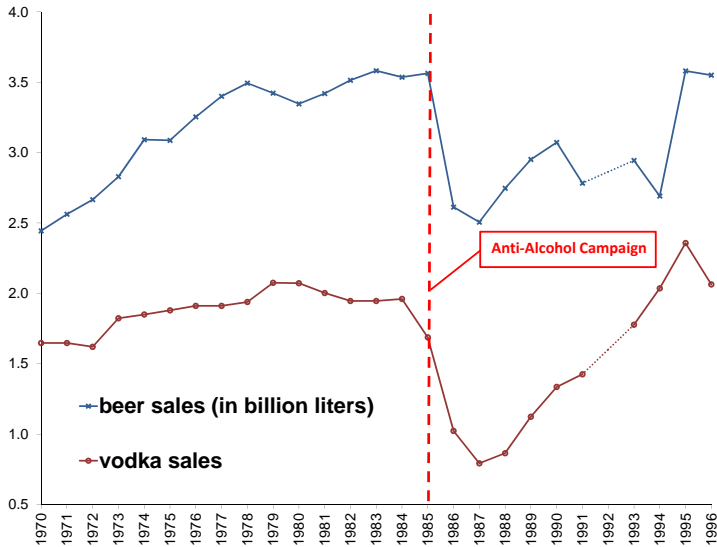
▶ great!! but what about incentives?

1ˢᵗ Experiment: **Gorbachev's Anti-Alcohol Campaign**

▶ However, dramatic increase in illegal production ("moonshine")

1st Experiment: **Gorbachev's Anti-Alcohol Campaign**

▶ However, dramatic increase in illegal production ("moonshine")

▶ Important for identification:

   ▶ easier to produce home-made vodka ("samogon") than beer

   ▶ easier to produce illegal vodka in rural areas

   ▶ law more strictly enforced in densely populated cities

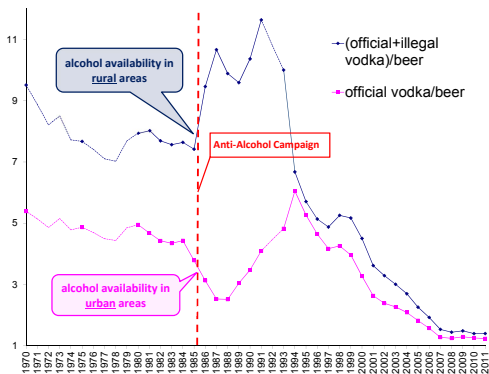| Dep. var: **share of samogon (%)**	(1)	(2)
Fraction of **urban** population (in %)	**-0.268*****	**-0.300*****
	[0.044]	[0.049]
Population (in 1,000)		0.625
		[0.402]
Observations: oblast-years 1980-92	981	981
R-squared	0.038	0.040

(standing on the shoulders of Bhattacharya, Gathmann, Miller (2013) by using their oblast-level data)

1st Experiment: **Gorbachev's Anti-Alcohol Campaign**

- ▶ However, dramatic increase in illegal production ("moonshine")

- ▶ Important for identification:
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  - ▶ easier to produce illegal vodka in rural areas
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- ⇒ difference-in-difference research design for long-run effects of policy on alcohol preferences:
  - ▶ urban (vs. rural) consumers that...
  - ▶ turned 16-18 during the campaign (vs. older and younger), ie. "sensitive years"

Difference-in-Difference Research Design

$$Share_{it}^{vodka} = \beta_{DD} \cdot \overbrace{I(\text{adolescent in 1987-91})_i}^{\text{treatment}} \times \overbrace{I(\text{urban})_i}^{\substack{\text{treatment} \\ \text{group}}}$$

$$+ \; \beta_D \cdot I(\text{adolescent in 1987-91})_i + \lambda \cdot I(\text{urban})_i$$

$$+ \; \gamma' x_{it} + \epsilon_{it}$$

Difference-in-Difference for Men

Dependent variable: **Share of vodka, 2001-2011 sample**	Baseline
	(1)
I(adolescent in 1987-1991) x I(urban)	-6.540***
	[2.065]
I(adolescent in 1987-1991)	**4.774*****
	[1.531]
Alcohol level, relative price, income	YES
Socio-economic demographics	YES
Region FE, Urban FE, Year FE, Age FE	YES
Observations	19,373
R-squared	0.100

▶ Campaign <u>increases</u> current vodka share of treated rural consumers by 5pp relative to untreated rural consumers

Difference-in-Difference for Men

Dependent variable: **Share of vodka, 2001-2011 sample**	Baseline (1)
I(adolescent in 1987-1991) x I(urban)	**-6.540***** [2.065]
I(adolescent in 1987-1991)	4.774*** [1.531]
Alcohol level, relative price, income	YES
Socio-economic demographics	YES
Region FE, Urban FE, Year FE, Age FE	YES
Observations	19,373
R-squared	0.100

▶ Campaign <u>decreases</u> current vodka share of treated urban consumers by 2pp relative to untreated urban consumers

▶ leading to a 7pp difference-in-difference (in absolute value)

Female preferences are affected about the same

Dependent variable: Share of vodka	Baseline	Top quartile dropped	Start at age 16	Female sample
	(1)	(3)	(6)	(7)
I(adolescent in 1987-1991) x I(urban)	-6.540*** [2.065]	-6.095*** [2.094]	-5.597*** [1.903]	-6.043*** [2.152]
I(adolescent in 1987-1991)	4.774*** [1.531]	5.563*** [1.621]	3.401** [1.464]	4.229** [1.807]
Alcohol level, relative price, income	YES	YES	YES	YES
Socio-economic demographics	YES	YES	YES	YES
Region FE, Urban FE, Year FE, Age FE	YES	YES	YES	YES

Placebo Tests & Identifying Preference-Forming Years
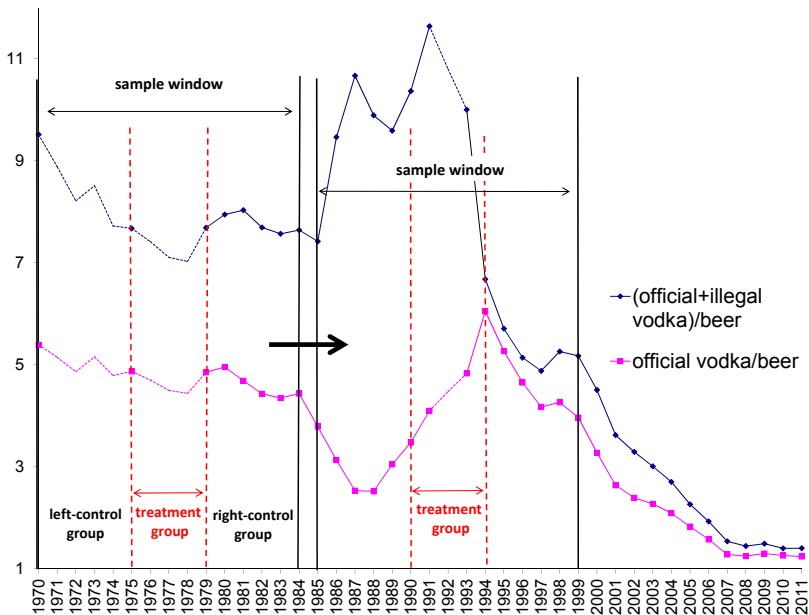
Identifying Preference-Forming Years: **Results**
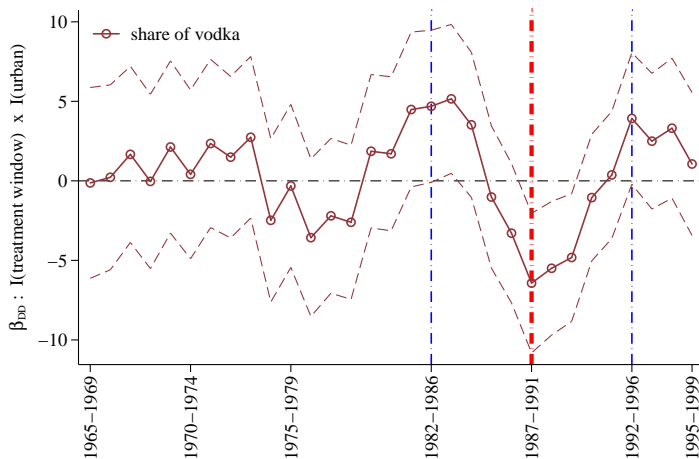
5–year treatment window of individuals turning 18 during those years

- ▶ red line: treatment group covers treatment period
- ▶ blue lines: control groups cover treatment period

2nd Experiment: **Collapse of Soviet Union**

- ▸ rapid expansion of many markets, in particular beer

- ▸ driven mainly by foreign competition ("trade/supply shock")

  - ▸ much larger shock than Anti-Alcohol campaign

  - ⇒ more power, but identification more difficult

- ▸ Aside: rapid expansion of many other markets

  - ⇒ used to provide external validity later:

    paper shows similar effects on relative preferences for
    non-alcoholic goods such as exotic fruits, chocolate, etc.

2ⁿᵈ Experiment: Beer Market Expansion after Soviet Union

2ⁿᵈ **Experiment:** **Research Design**

- ▶ ideally we would do regression discontinuity (RD). However:
    - ▶ market expansion takes time to reach new steady state
    - ▶ legal drinking age neither necessary nor sufficient for treatment

- ▶ instead, our approach adapts this "ideal" research design to our context
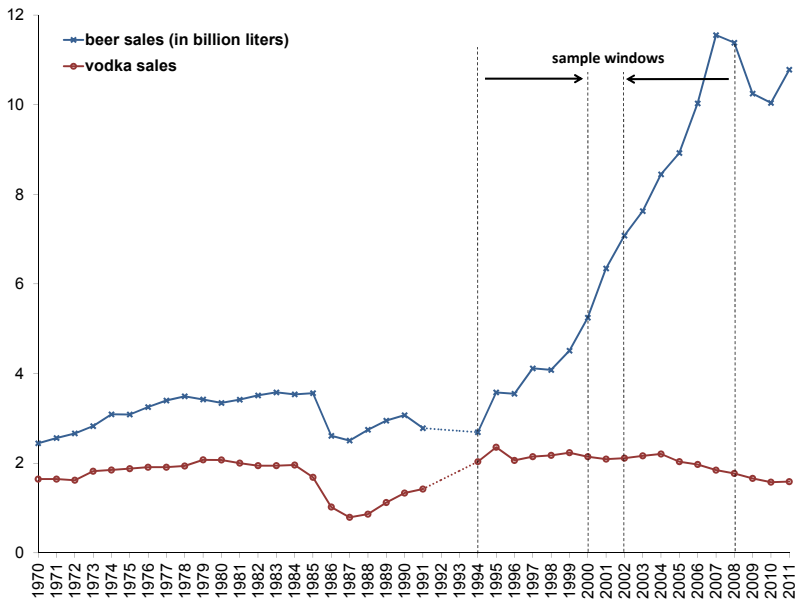
- ▶ **Idea**
    1. compare consumption of people that turned 18 during expansion in more and more narrow windows
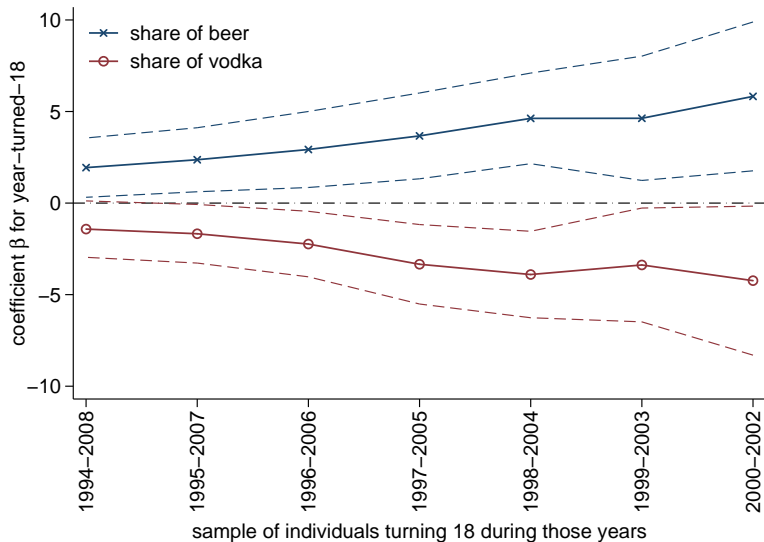
    $$Share_{it}^{beer} = \beta \cdot \text{year-turned-18}_i + \gamma' x_{it} + \epsilon_{it}$$

    2. estimate preference-forming years by shifting "placebo" sample windows through time
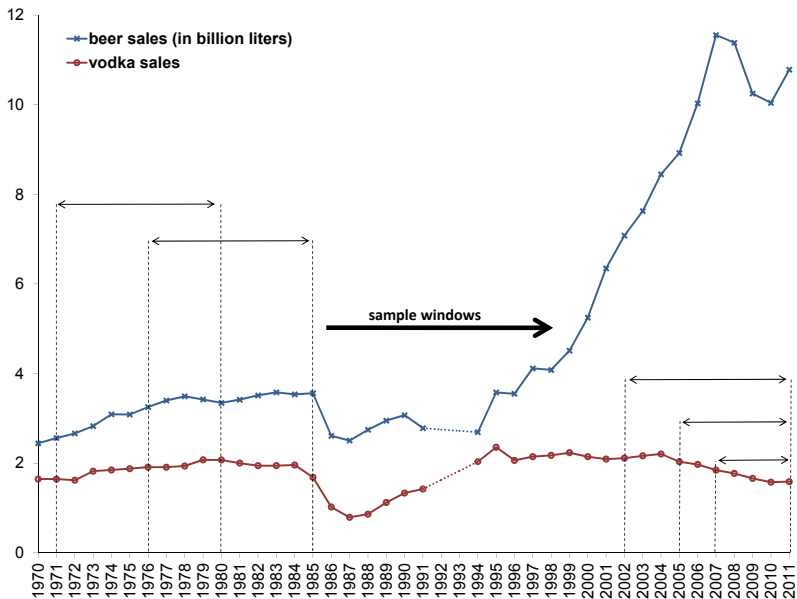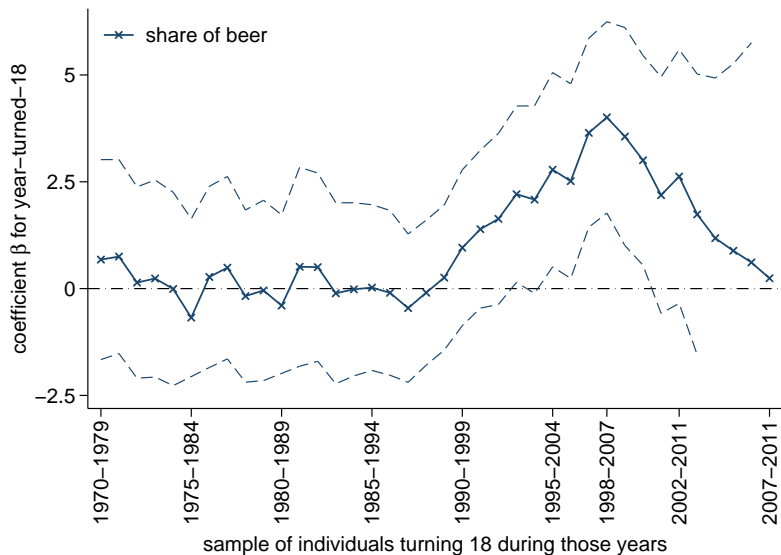
2ⁿᵈ Experiment: Research Design

2nd Experiment: Results

coefficient β for year-turned–18

- share of beer
- share of vodka

sample of individuals turning 18 during those years

## Placebo Tests & Identifying Preference-Forming Years

Identifying Preference-Forming Years: Results

Alcohol Preferences and Male Mortality

- ▶ Low life expectancy among working-age men is one of the biggest problems in Russia (60 years vs. 75 in US)

- ▶ Closely related to short-term consequences of excessive alcohol consumption (eg Brainerd and Cutler 2005)

- ▶ We argue that type of alcohol (hard vs light) is crucial
  - ▶ binge drinking more likely with hard alcohol
  - ▶ relative alcohol preferences drive working-age male mortality (even controlling for level of alcohol!)

- ▶ We **test this hypothesis** using micro and aggregate data
  - ▶ Time series: Regress working-age mortality rate on aggregate alcohol level and shares
  - ▶ Cross-section: Hazard regression on alcohol level and shares

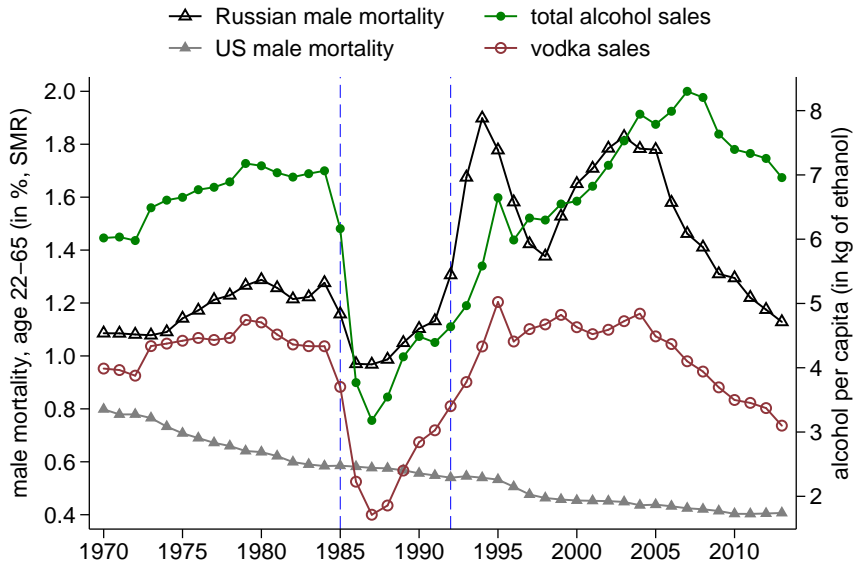**Alcohol Preferences and Male Mortality: Russia vs. US**
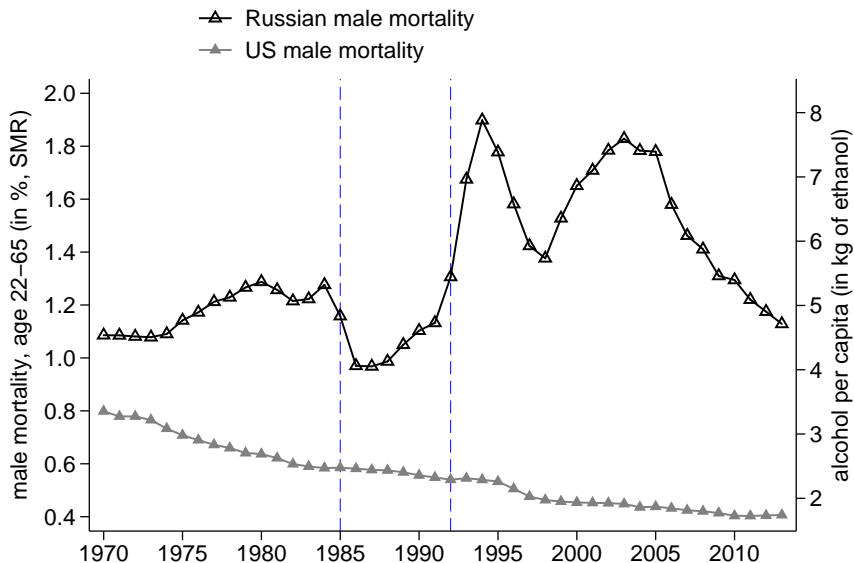
Alcohol Preferences and Male Mortality: Alcohol Level

Alcohol Preferences and Male Mortality: Alcohol Level

Alcohol Preferences and Male Mortality: Hard Alcohol

Alcohol Preferences and Male Mortality: **Agg. Regression**

Panel B: Aggregate data, 1970-2013	(1)	(2)	(3)
Aggregate **share of vodka** sales (in %)	0.022***		**0.024*****
	[0.003]		[0.006]
Aggregate share of beer sales (in %)		-0.035***	0.004
		[0.005]	[0.011]
Total alcohol sales per capita	0.080***	0.106***	**0.076*****
	[0.017]	[0.021]	[0.019]
Time trend	YES	YES	YES
Observations	44	44	44
R-squared	0.778	0.692	0.778

Interpretation

▶ Decreasing vodka share by 30pp (=1 StDev) relative to beer share would reduce mortality by 30%

Alcohol Preferences and Male Mortality: Hazard Regression

	Males age 22-65		
Panel A: Cox proportional hazard model	(1)	(2)	(3)
Share of vodka (not in percentage)	0.650***		**0.488****
	[0.191]		[0.197]
Share of beer (not in percentage)		-1.123***	-0.825*
		[0.418]	[0.440]
Alcohol intake (liters of pure alcohol)	1.108**	0.750	**0.897**
	[0.525]	[0.559]	[0.546]
Socio-economic demographics	YES	YES	YES
Observations	6,623	6,623	6,623

Interpretation

▶ Decreasing vodka share by 30pp (=1 StDev) relative to beer share would reduce mortality by 33%

Alcohol Preferences and Male Mortality: 2 Counterfactuals

1. How much of the recent decline in male mortality can changes in relative alcohol shares explain?

   ▶ decline in the vodka share explains 56% of mortality decrease

   ▶ decline in level of alcohol explains another 16%

2. Going forward, how much will mortality further decrease due to younger generations preferences for light alcohol?

Panel C: Counterfactual	Poplulation vodka share	Mortality rate of males age 22-65 (in %)
current year	46.19	1.42
in 10 years	32.30	1.25
in 20 years	23.26	1.09
long run	15.88	0.81

1. **Long-Run Preferences vs. Age Effects**

Previous studies have emphasized

- ▶ age profiles of drug use

- ▶ ie. consumers start out with light drugs before switching to harder drugs later in life ("stepping stone/gateway" effect of light drugs)

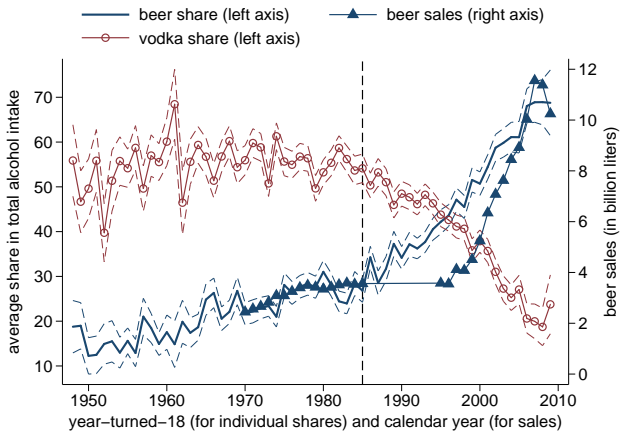We **use the panel dimension** to show that this is not the case for alcohol

- ▶ while light alcohol consumption decreases in age *unconditionally*

- ▶ we show that this is the results of cohort effects, ie fixed individual traits

- ▶ after controlling for individual FEs there is only a limited age profile for consumers in their early 20s

Unconditional Average Age Profile

▶ The pooled cross-section seems to show a strong age profile

▶ However, this is driven almost entirely by cohort effects,
  ie. the effect of past shocks to product availability

Unconditional Average Cohort Profile

- ▶ Younger cohorts consume more beer mostly due to better market access, not because of age
- ▶ To show this, we exploit the panel dimension to take these fixed cohort effects out and plot the residual age profile

## Residual Age Profile after Individual FEs
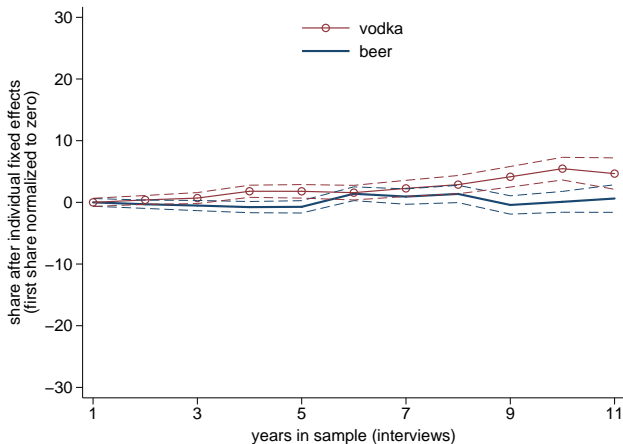
- ▶ The residual age profile is flat on average
- ▶ As the next figure shows, there is a limited age profile for very young consumers

Residual Age Profile after Individual FEs: 18-24 Year Olds
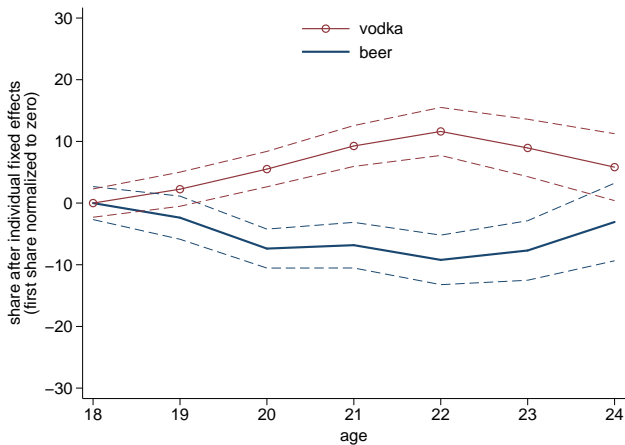
▶ Young consumer have a modest age profile until about age 22

▶ As the next figure shows, the age profile is entirely flat from then on

Residual Age Profile after Individual FEs: 25-29 Year Olds
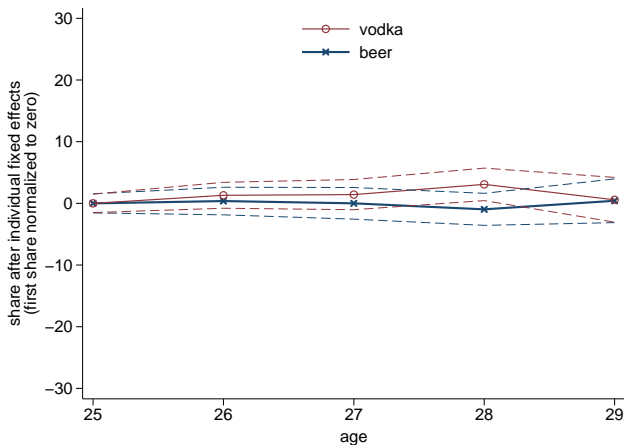
- ▶ Hence, stepping-stone effects can explain at most about 1/4 of the unconditional age profile
- ▶ The rest are the long-run effects of past policies on preferences that result in cohort effects

2. Using A Migrants Research Design

- ▶ previous literature mostly relies on migrants research design

- ▶ we obtain similar results using migrants

Research Design: We use three sets of migrants

1. migrants from rural to urban areas within Russia

2. immigrants from wine-producing Soviet republics to Russia

3. immigrants from any Soviet republic to Russia

Using A Migrants Research Design: Results

Dependent variable: Share of vodka (columns 1-2) or wine (3-8)	Migrants to cities	Immigrants from other Soviet republics	
		OLS	IV
	(2)	(4)	(7)
I(born in a rural now living in an urban area)	2.086** [1.060]		
I(immigrated from Georgia or Moldova)		3.152** [1.523]	
Share of wine by country of origin (leave-out mean)			0.672* [0.373]
Income, relative price, level of alcohol intake	YES	YES	YES
Socio-economic demographics	YES	YES	YES
Region, year, age FE	YES	YES	YES
Observations	19,111	44,029	43,849
R-squared	0.181	0.051	0.015

▶ we find that migrants have preferences that are correlated with the typical consumer behavior in their place of origin

▶ this is consistent with previous research on migrants' spending behavior

3. Long-Run Preferences for Non-Alcoholic Goods

Use rapid expansion of access to other "new/exotic" goods after
the collapse of the Soviet Union that were previously unavailable or
severely rationed

- ▶ RLMS does not contain detailed expenditure data on new,
  exotic goods (only chicken)

- ▶ Use different expenditure data: National Survey of Household
  Welfare and Program Participation (NOBUS)

    - ▶ single cross-section in 2003 done by World Bank and
      Goskomstat

    - ▶ detailed expenditure categories for 45,000+ households

    - ▶ detailed coverage of non-alcoholic goods

    - ▶ issues with preference aggregation and inherited vs. acquired
      preferences

Long-Run Effect of Collapse of Soviet Union on
Non-Alcoholic Preferences

Dependent variable: Share of non-alcoholic goods	share of new goods (NOBUS)				chicken (RLMS)
	all new goods	subtropical fruits	chocolate	chicken	
	(1)	(2)	(3)	(8)	(10)
I(born in 1990s)					9.408*
					[4.945]
I(born in 1980s)	11.930***	8.621***	9.157***	10.737***	7.005***
	[1.152]	[2.557]	[1.728]	[3.067]	[2.669]
I(born in 1970s)	7.173***	5.551***	6.814***	-2.302	4.952**
	[0.743]	[1.589]	[1.530]	[1.905]	[2.359]
Log(real income)	-0.032	0.211*	-0.165	-0.000	-0.164
	[0.048]	[0.113]	[0.138]	[0.122]	[0.187]
Family size	-0.201	0.873	5.574***	-7.309***	-7.333***
	[0.350]	[0.813]	[0.995]	[0.890]	[0.846]
Region x good FE	YES				
Region FE		YES	YES	YES	YES
Family income and size	YES	YES	YES	YES	YES
Relative price and family age					YES
Year FE					YES
Observations	44,186	6,576	4,584	9,492	6,513
R-squared	0.365	0.052	0.061	0.067	0.094

▶ we find similar cohort effects for these non-alcoholic goods
▶ suggests that previous results are not driven by addiction

Conclusion

This paper makes **<u>two main contributions</u>**. We show that

1. **temporary policy** can have significant **long-run effects by changing preferences**

2. the *type* of alcohol consumed (light vs. hard) has significant effect on mortality, *in addition* to the level of alcohol consumed

$\Rightarrow$ Policies targeted at younger consumers that limit their access to hard alcohol can be very effective at reducing external causes of death related to alcohol (accidents, suicides, homicides), even later in life