## Social Media and Protest Participation: Evidence from Russia

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### Main Idea

- Estimating causal impact of social media is challenging:
  - endogeneity problem social media usage is a choice variable
  - ► lack of geographical variation protests in a small number of locations does not allow to study effects of availability of social media
- Russia in 2011-2012 is perfect example for the empirical investigation
  - unexpected wave of protests triggered by elections, first large-scale protests since the end of USSR
  - ► significant geographical variation
    - ★ 625 cities, 133 cities with protests
- Social media dominated by VKontakte (VK)
  - ► Russian version of Facebook with 55 million users in 2011
  - use information about the history of the creation of VK for identification
    - ★ origins of students studying at SPbSU at the time of creation

#### Collective action and online social networks

- Collective action problems = obstacles to achieving socially beneficial outcomes (Olson 1968, Hardin 1982, Ostrom 1990), e.g.
  - consumers interested in low tariffs
  - ► people favoring environment protection
  - citizens fighting corruption in countries with weak institutions
- Do online social networks (=horizontal communication technologies) reduce the costs of overcoming collective action problems?
- Look at this question using the example of online social networks and protest participation in Russia in 2011-2012

### Preview of results

- Penetration of social media in Russian cities increased protest participation, with 10% increase in VK penetration leading to
  - ▶ 19% increase in protest participation
  - ► 4.6% increase in the probability of protests
- 2 Information channel is unlikely to explain the results
  - ► more, not less pro-government attitudes and behavior in places with higher VK penetration
  - no evidence of increased polarization
- 3 Reduction in the costs of collective action is a likely channel

### Contribution

- Existing literature :
  - ► Mostly focused on broadband effect, not on social media (Falck et al. 2014, Campante et al. 2014, Bhuller et al. 2013)
  - ► Protests are important for policies and rent distribution (Madestam et al. 2012, Acemoglu et al. 2015, Passarelli and Tabellini 2013)
  - ► Why communication technology should matter? Theories (Edmond 2013, Little 2015, Barbera Jackson 2016), but no empirical tests
- Novelty: our paper looks at the causal impact of social media penetration on protest incidence and participation
  - ► Additional evidence consistent with reducition of the costs of collective action, but not the information channel
- Methodology: approach to study the impact of penetration of any type of technology
  - ▶ use social distance from inventors of new technologies

### We are for Normal Distribution!

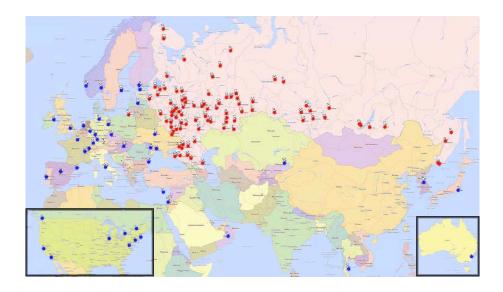


## Electoral fraud: trigger

We don't trust Churov (Head of Electoral Commission), we trust Gauss!



Map of protests (10/12/2011)



## Roadmap

- Background on VK
- Source of variation: SPbSU student cohorts fluctuations
  - ► basic evidence, reduced form estimation
- Baseline results. IV estimation
- 4 Mechanisms

## Roadmap

- Background on VK
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## Background on VK

#### Timeline

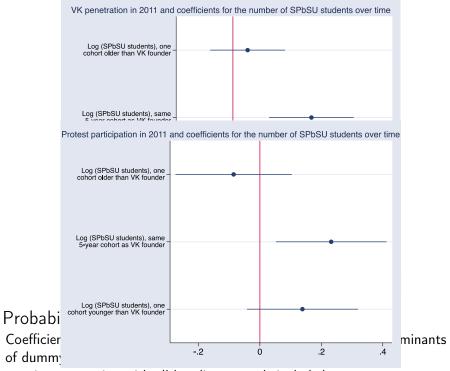
- October 2006 VKontakte (VK) created as a Russian clone of Facebook
  - ► founder Pavel Durov, who was at that time a student of philology department
  - ▶ initially, by invitation only (through student forum, created also by Durov)
- First VK users
  - ▶ mostly students from SPbSU; different home cities
  - most of them never returned to their home cities, but still had networks of friends and relatives there
- End of November 2006 open registration
- Later:
  - ► Summer 2008 Facebook offered Russian interface
  - ▶ 2011 55 million VKontakte users, 6 million Facebook users

### Source of variation

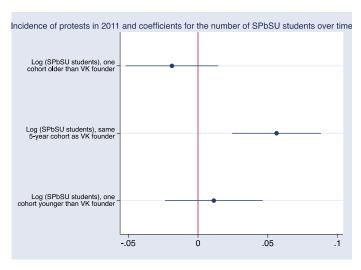
- Argument: idiosyncratic variation in the distribution of early users has a long lasting effect
  - ► attract new users through network externalities
  - ► deter opening Facebook accounts
- Instrument: fluctuations in inter-city student flows
  - ► Originally, accounts by invitation only
  - ► Early penetration can be correlated with unobserved taste parameter
  - ► We use information on city origins of the students studying in St Petersburg State University by cohort
    - ★ separate cohort studying with the VK founder (+- 2 years) from older or yonger cohorts

## VK penetration and inter-city student flows Coefficients for the number of students of different origin as determinants of 2011 VK penetration

• in a regression with all baseline controls included



• in a regression with all baseline controls included

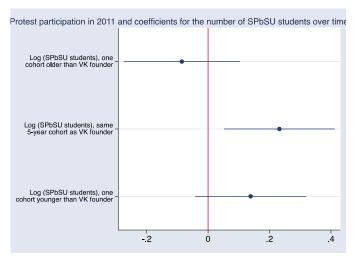


## VK penetration and inter-city student flows

_	Log (number of VK users), Aug 2								
Log (SPbSU students), same 5-year cohort as VK founder	0.1581***	0.1322***	0.1393***	0.1371***	0.1360***				
	[0.0425]	[0.0489]	[0.0482]	[0.0463]	[0.0488]				
Log (SPbSU students), one cohort younger than VK founder	-0.0292	-0.0452	-0.0433	-0.0464	-0.0457				
	[0.0552]	[0.0461]	[0.0468]	[0.0472]	[0.0474]				
Log (SPbSU students), one cohort older than VK founder	0.025	0.0161	0.0175	0.0137	0.0142				
	[0.0523]	[0.0468]	[0.0467]	[0.0445]	[0.0454]				
Regional center	0.2952***	0.3015*	0.2563*	0.3008*	0.3026*				
	[0.0899]	[0.1583]	[0.1526]	[0.1539]	[0.1523]				
Distance to Saint Petersburg, km		0.0001	0.0001	0.0002	0.0000				
		[0.0001]	[0.0001]	[0.0001]	[0.0001]				
Distance to Moscow, km		-0.0002	-0.0002	-0.0003	-0.0001				
		[0.0001]	[0.0001]	[0.0002]	[0.0001]				
Rayon center (county seat)		-0.0142	-0.0134	-0.0056	-0.0155				
		[0.0873]	[0.0869]	[0.0906]	[0.0843]				
Log (average wage), city-level, 2011		0.2108	0.1977	0.1756	0.1386				
		[0.1637]	[0.1686]	[0.1691]	[0.1571]				
Presence of a university in a city, 2011		-0.0224	-0.0087	-0.0348	-0.0056				
		[0.1496]	[0.1468]	[0.1478]	[0.1441]				
Internet penetration, region-level, 2011		-0.1190	-0.1572	-0.0677	-0.0875				
		[0.2304]	[0.2144]	[0.2272]	[0.2254]				
Log (number of Odnoklassniki users), 2014		0.1475*	0.1391*	0.1322	0.1706**				
		[0.0798]	[0.0806]	[0.0801]	[0.0793]				
Ethnic fractionalization, 2010		0.4041*	0.4872**	0.5660***	0.4599**				
		[0.2149]	[0.2073]	[0.2016]	[0.2197]				
Observations	625	625	625	625	625				
R-squared	0.8263	0.8517	0.8546	0.8550	0.8540				
Population controls	Yes***	Yes***	Yes**	Yes***	Yes***				
Age cohort controls		Yes**	Yes***	Yes**	Yes**				
Education controls		Yes***	Yes***	Yes***	Yes***				
Electoral controls, 1995			Yes						
Electoral controls, 1999				Yes*					
Electoral controls, 2003					Yes				

## Protest participation and inter-city student flows Coefficients for the number of students of different origin as determinants of protest participation

• in a regression with all baseline controls included



# Protest participation and student cohorts

	Log (nui	nber of pr	otesters),	Dec 2011	Incidence	of protes	ts, dumm	y, Dec 2011
Log (SPbSU students), same 5-year cohort as VK founder	0.253**	0.259**	0.263**	0.274**	0.062***	0.062***	0.064***	0.065***
	[0.114]	[0.114]	[0.115]	[0.116]	[0.020]	[0.020]	[0.020]	[0.021]
Log (SPbSU students), one cohort younger than VK founder	0.152	0.150	0.137	0.160	0.012	0.011	0.009	0.012
	[0.105]	[0.105]	[0.105]	[0.106]	[0.020]	[0.020]	[0.020]	[0.020]
Log (SPbSU students), one cohort older than VK founder	-0.075	-0.072	-0.082	-0.068	-0.017	-0.016	-0.018	-0.015
	[0.113]	[0.113]	[0.112]	[0.113]	[0.020]	[0.020]	[0.020]	[0.020]
Regional center	0.287	0.288	0.318	0.292	-0.015	-0.013	-0.009	-0.014
	[0.488]	[0.480]	[0.480]	[0.487]	[0.099]	[0.097]	[0.096]	[0.098]
Distance to Saint Petersburg, km	-0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Distance to Moscow, km	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
D	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Rayon center (county seat)	0.003	0.005	-0.029	-0.051	-0.001	0.001	-0.007	-0.011
Les (everes viere) ett level 2011	[0.044] 0.100	[0.046] 0.147	[0.048] 0.001	[0.054] -0.068	[0.009] 0.021	[0.009]	[0.010] 0.007	[0.011] -0.014
Log (average wage), city-level, 2011	[0.176]	[0.190]	[0.193]	[0.184]	[0.034]	[0.039]	[0.036]	[0.034]
Presence of a university in a city, 2011	0.870**	0.876**	0.860**	0.898**	0.196**	0.195**	0.195**	0.200**
riesence of a university in a city, 2011	[0.423]	[0.423]	[0.422]	[0.426]	[0.098]	[0.098]	[0.097]	[0.097]
Internet penetration, region-level, 2011	0.138	0.181	0.175	0.149	-0.013	0.005	-0.003	-0.007
internet penetration, region level, 2011	[0.243]	[0.240]	[0.280]	[0.257]	[0.045]	[0.045]	[0.054]	[0.048]
Log (number of Odnoklassniki users), 2014	0.104	0.081	0.157	0.133	0.032*	0.024	0.041*	0.034*
9 (	[0.109]	[0.120]	[0.123]	[0.119]	[0.017]	[0.019]	[0.021]	[0.019]
Ethnic fractionalization, 2010	-0.580*	-0.516	-0.468	-0.506	-0.089	-0.081	-0.071	-0.067
	[0.321]	[0.335]	[0.337]	[0.343]	[0.059]	[0.061]	[0.062]	[0.062]
Observations	625	625	625	625	625	625	625	625
R-squared	0.823	0.826	0.828	0.826	0.776	0.780	0.781	0.781
Population controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Age cohort controls	Yes*	Yes**	Yes**	Yes**	Yes**	Yes***	Yes***	Yes***
Education controls	Yes*	Yes**	Yes**	Yes**	Yes*	Yes*	Yes*	Yes*
Electoral controls, 1995		Yes**				Yes**		
Electoral controls, 1999			Yes**				Yes*	
Electoral controls, 2003				Yes*				Yes***

VK penetration and protest participation

Panel A. Number of protesters	эс р		pat					
i allei A. Hulliber of protesters			Log (nu	mber of pr	ntostors)	Dec 2011		
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
Log (number of VK users), Aug 2011	1.912**	1.863**	1.920**	2.015**	0.228***	0.216***	0.216***	0.227***
	[0.900]	[0.862]	[0.886]	[0.906]	[0.072]	[0.072]	[0.074]	[0.076]
Log (SPbSU students), one cohort younger than VK founder	0.238*	0.231*	0.227*	0.252*	0.224**	0.224**	0.211*	0.236**
	[0.124]	[0.125]	[0.125]	[0.131]	[0.107]	[0.109]	[0.108]	[0.108]
Log (SPbSU students), one cohort older than VK founder	-0.106	-0.105	-0.108	-0.097	0.013	0.019	0.011	0.027
	[0.143]	[0.143]	[0.136]	[0.144]	[0.092]	[0.091]	[0.089]	[0.092]
Population controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Age cohort controls	Yes	Yes	Yes	Yes	Yes*	Yes*	Yes**	Yes**
Education controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Electoral controls, 1995		Yes				Yes		
Electoral controls, 1999			Yes				Yes	
Electoral controls, 2003				Yes*				Yes**
Observations	625	625	625	625	625	625	625	625
Effective F-statistics (Olea Montiel and Pflueger 2013)	276.8	274	274	274				
Panel B. Probability of protests								
			Incidence	of protes	ts, dumm	y, Dec 201	1	
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
Log (number of VK users), Aug 2011	0.466***	0.446***	0.464***	0.481***	0.039***	0.037***	0.037***	0.039***
Log (number of VK users), Aug 2011								OLS 0.039*** [0.014]
Log (number of VK users), Aug 2011  Log (SPbSU students), one cohort younger than VK founder	0.466*** [0.180] 0.033	0.446*** [0.169] 0.030	0.464*** [0.174] 0.031	0.481*** [0.181] 0.034	0.039*** [0.013] 0.029	0.037*** [0.013] 0.029	0.037*** [0.013] 0.027	0.039*** [0.014] 0.031
Log (SPbSU students), one cohort younger than VK founder	0.466*** [0.180] 0.033 [0.025]	0.446*** [0.169] 0.030 [0.026]	0.464*** [0.174] 0.031 [0.026]	0.481*** [0.181] 0.034 [0.027]	0.039*** [0.013] 0.029 [0.020]	0.037*** [0.013] 0.029 [0.021]	0.037*** [0.013] 0.027 [0.021]	0.039*** [0.014] 0.031 [0.020]
, ,	0.466*** [0.180] 0.033 [0.025] -0.024	0.446*** [0.169] 0.030 [0.026] -0.023	0.464*** [0.174] 0.031 [0.026] -0.025	0.481*** [0.181] 0.034 [0.027] -0.021	0.039*** [0.013] 0.029 [0.020] 0.006	0.037*** [0.013] 0.029 [0.021] 0.007	0.037*** [0.013] 0.027 [0.021] 0.005	0.039*** [0.014] 0.031 [0.020] 0.009
Log (SPbSU students), one cohort younger than VK founder Log (SPbSU students), one cohort older than VK founder	0.466*** [0.180] 0.033 [0.025] -0.024 [0.029]	0.446*** [0.169] 0.030 [0.026] -0.023 [0.029]	0.464*** [0.174] 0.031 [0.026] -0.025 [0.028]	0.481*** [0.181] 0.034 [0.027] -0.021 [0.030]	0.039*** [0.013] 0.029 [0.020] 0.006 [0.017]	0.037*** [0.013] 0.029 [0.021] 0.007 [0.017]	0.037*** [0.013] 0.027 [0.021] 0.005 [0.017]	0.039*** [0.014] 0.031 [0.020] 0.009 [0.018]
Log (SPbSU students), one cohort younger than VK founder Log (SPbSU students), one cohort older than VK founder Population controls	0.466*** [0.180] 0.033 [0.025] -0.024 [0.029] Yes***	0.446*** [0.169] 0.030 [0.026] -0.023 [0.029] Yes***	0.464*** [0.174] 0.031 [0.026] -0.025 [0.028] Yes***	0.481*** [0.181] 0.034 [0.027] -0.021 [0.030] Yes***	0.039*** [0.013] 0.029 [0.020] 0.006 [0.017] Yes***	0.037*** [0.013] 0.029 [0.021] 0.007 [0.017] Yes***	0.037*** [0.013] 0.027 [0.021] 0.005 [0.017] Yes***	0.039*** [0.014] 0.031 [0.020] 0.009 [0.018] Yes***
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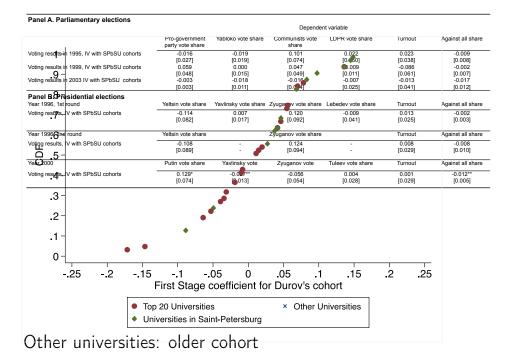
## Roadmap

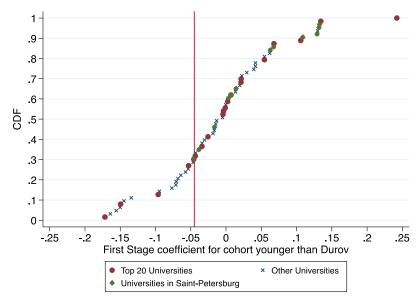
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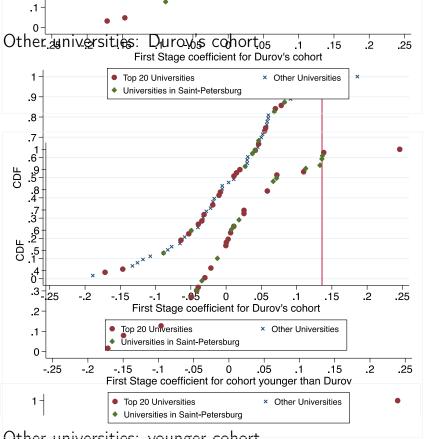
## Protest placebo

Panel A. Participation in earlier protests	Log (n	umber of pro	tactore) 108	Log (pro	-democracy r	rotesters), 19	87-1002	
og (number of VK users), Aug 2011	0.534	0.427	0.284	0.493	0.144	-0.011	0.017	0.141
og (Hamber of VIC asers), Aug 2011	[1.883]	[1.943]	[1.839]	[1.927]	[1.495]	[1.510]	[1.491]	[1.573]
P-value for equality of coefficients with that in Table 4	0.492	0.488	0.413	0.463	0.295	0.277	0.265	0.288
	Log (parti	cipants in lab	or protests). 1	997-2002	Log (p	articipants in s	social protests	.) 2005
og (number of VK users), Aug 2011	-0.562	-0.537	-1.380	-0.497	-0.313	-0.292	-0.075	-0.042
3 ( )	[1.877]	[1.716]	[1.831]	[1.962]	[1.632]	[1.497]	[1.569]	[1.600
P-value for equality of coefficients with that in Table 4	0.216	0.193	0.094*	0.220	0.273	0.256	0.314	0.304
Panel B. Incidence of earlier protests								
·	Inc	idence of pro	tests, 1987-19	992	Incidence	of pro-democr	acy protests.	1987-199
og (number of VK users), Aug 2011	0.009	0.007	-0.015	0.024	-0.011	-0.020	-0.023	0.004
	[0.281]	[0.282]	[0.267]	[0.281]	[0.195]	[0.195]	[0.191]	[0.198
2-value for equality of coefficient with that in Table 5	0.194	0.202	0.155	0.197	0.090*	0.092*	0.078*	0.091
	Incide	ence of labor	protests, 1997	7-2002	Incidence of social protests, 2			
.og (number of VK users), Aug 2011	-0.070	-0.060	-0.172	-0.036	-0.057	-0.055	-0.022	-0.019
	[0.243]	[0.219]	[0.238]	[0.256]	[0.239]	[0.221]	[0.230]	[0.235
-value for equality of coefficient with that in Table 5	0.056*	0.047**	0.021**	0.065*	0.105	0.099*	0.123	0.117
Population, Age cohorts, Education, and Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Electoral controls, 1995		Yes				Yes		
electoral controls, 1999			Yes				Yes	
electoral controls, 2003				Yes				Yes
Observations	625	625	625	625	625	625	625	625

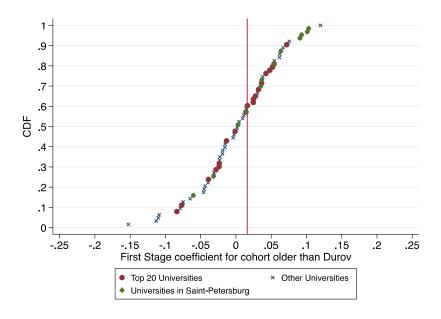
## Placebo: pre-VK voting







Other universities: younger cohort



## Roadmap

- Background on VK
- Source of variation: SPbSU student cohorts fluctuations
  - ► basic evidence, reduced form estimation
- Baseline results. IV estimation
- Mechanisms

## Individual utility

- Protest only if the regime is perceived as "bad":  $\theta(s) < 0$
- Utility of an individual protester, if the regime is "bad":

$$\gamma_i + \pi(s, P)\alpha_i - c(s, P) - \varepsilon_i$$

- $\triangleright \gamma_i$  instrinsic motivation
- ► s social media penetration
- $\rightarrow \pi(s, P)$  probability of being seen (offline or online)
- $\alpha_i$  utility from being seen in a protest (can be <0)
- ightharpoonup c(s, P) is the cost of participation consists of the cost of
  - ★ learning the logistics of a protest (which is a decreasing function of the social media penetration s)
  - ★ the expected cost of protesting (which is a decreasing function of the size of a protest P),
  - \* with some potential complementarities between the two.
- $\varepsilon_i$  idiosyncratic cost of protest participation

## Conceptual framework

- Protest participation: similar to other forms of political participation
  - $p = \frac{P}{N}$  propensity to protest
- Individual participate in protests iff

instrumental benefits + non - instrumental benefits - costs > 0

- here instrumental benefits,  $= B_i \Delta Prob_i (successful \mid P)$ 
  - $\star$  where  $B_i$  is the benefit for individual i if the protest is successful
- ▶  $\Delta Prob_i(successful \mid P)$  is the marginal increase in the probability that the protest is successful if person i decides to participate
  - ★ Large aggregate number of participants  $\Rightarrow \Delta Prob_i(successful \mid P) = 0$

### Theoretical channels

Propensity to protest:

$$p = \frac{P}{N} = I(\theta < 0 \mid s) * F(\gamma_i + \pi(s, P)\alpha_i - c(s, P))$$

- Effect of social media penetration:
- 0

$$\frac{\partial p}{\partial s} = \underbrace{\frac{\partial I(\theta < 0 \mid s)}{\partial s} F(\cdot)}_{information} + I(\theta < 0 \mid s) f(\cdot) \underbrace{\begin{pmatrix} \frac{\partial \alpha_i \pi(s, P)}{\partial s} - \frac{\partial c(s, P)}{\partial s} \\ \frac{\partial coordinatio}{\partial s} \end{pmatrix}}_{collective\ action}$$

## Information channel: vote for the government

	Voting s	share for U	Inited Russ	ia, 2007	Voting s	hare for L	Inited Rus	sia, 2011
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (number of VK users), Aug 2011	0.035	0.019	0.045	0.003	0.230*	0.179*	0.230*	0.182*
	[0.050]	[0.041]	[0.046]	[0.037]	[0.128]	[0.099]	[0.118]	[0.104]
Log (SPbSU students), one cohort younger than VK founder	-0.007	-0.004	-0.006	-0.007	-0.002	0.002	-0.001	0.000
Log (SPbSU students), one cohort older than VK founder	[0.009] 0.002	[0.008] 0.001	[0.008] -0.000	[0.007] -0.003	[0.017] 0.004	[0.014] 0.006	[0.016] 0.001	[0.013] -0.002
Log (SPDSO students), one conort older than VK lounder	[0.002	[0.007]	[0.008]	[0.003	[0.017]	[0.013]	[0.015]	[0.013]
Population controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age cohort controls	Yes***	Yes***	Yes***	Yes**	Yes	Yes	Yes	Yes
Education controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Other controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Electoral controls, 1995		Yes***				Yes***		
Electoral controls, 1999			Yes***				Yes***	
Electoral controls, 2003				Yes***				Yes***
Observations	625	625	625	625	625	625	625	625
Effective F-statistics (Olea Montiel and Pflueger 2013)	276.8	274	274	274	276.8	274	274	274
	1/		Marabasas	2000				
	Voung	Share for	Medvedev	, 2006	· ———	/oting Share	for Putin, 20	12
Log (number of VK users), Aug 2011	0.125*	0.115*	0.137**	0.098*	0.127*	0.111*	0.127*	0.096
.,	[0.071]	[0.062]	[0.067]	[0.054]	[0.073]	[0.065]	[0.067]	[0.058]
Log (SPbSU students), one cohort younger than VK founder	-0.005	-0.003	-0.005	-0.004	0.002	0.003	0.003	0.002
	[0.011]	[0.009]	[0.010]	[800.0]	[0.011]	[0.010]	[0.010]	[800.0]
Log (SPbSU students), one cohort older than VK founder	0.001	-0.000	-0.003	-0.003	0.008	0.007	0.005	0.003
	[0.009]	[800.0]	[0.009]	[0.007]	[0.011]	[0.010]	[0.010]	[0.009]
Population controls	Yes	Yes	Yes*	Yes**	Yes	Yes	Yes*	Yes*
Age cohort controls	Yes**	Yes*	Yes**	Yes	Yes	Yes	Yes	Yes
Education controls	Yes	Yes	Yes	Yes	Yes***	Yes***	Yes***	Yes***
Other controls	Yes***	Yes***	Yes***	Yes***	Yes***	Yes*** Yes***	Yes***	Yes***
Electoral controls, 1995		Yes***	V***			Yes	V***	
Electoral controls, 1999 Electoral controls, 2003			Yes***	Yes***			Yes***	Yes***
				162				162
	625	625	625	625	625	625	625	625
Observations Effective F-statistics (Olea Montiel and Pflueger 2013)	625 276.8	625 274	625 274	625 274	625 276.8	625 274	625 274	625 274

### Pre-election intentions

	Which party are you planning to vote for in December elections									
	United Russia	Just Russia	LDPR	KPRF	Patriots of Russia	Yabloko				
Log (number of VK users), Aug 2011	0.220* [0.124]	0.038	-0.045 [0.043]	-0.029 [0.054]	-0.001 [0.007]	-0.007 [0.011]				
Log (SPbSU students), one cohort younger than VK founder	-0.001 [0.015]	0.000 [0.005]	0.005 [0.004]	0.003	0.001 [0.001]	0.001				
Log (SPbSU students), one cohort older than VK founder	-0.039** [0.020]	-0.004 [0.007]	0.004	0.001	0.000	-0.002 [0.002]				
	Do you pe	ersonally admit	or exclude a	possibility to	take part in a					
	Admit	Exclude	Difficult to answer							
Log (number of VK users), Aug 2011	-0.238* [0.130]	0.085 [0.155]	0.161 [0.111]							
Log (SPbSU students), one cohort younger than VK founder	-0.006 [0.013]	-0.001 [0.014]	0.006							
Log (SPbSU students), one cohort older than VK founder	0.023	-0.023 [0.023]	-0.002 [0.020]							

## Information channel: survey evidence

	Ho	w do you asse	ss the work o	f president D	mitry Medved	dev			
	Good and getting better	Good and remains the same	Good and getting worse	Bad, but getting better	Bad and remains the same	Bad and getting worse			
	(1)	(2)	(3)	(4)	(5)	(6)			
Log (number of VK users), Aug 2011	0.207**	-0.070	-0.046	-0.081*	-0.014	0.027			
Log (SPbSU students), one cohort younger than VK founder	[0.097] -0.009	[0.113] 0.009	0.048]	[0.047] 0.011**	[0.066] 0.002	[0.052] 0.005			
Log (SPbSU students), one cohort older than VK founder	[0.015] -0.012	-0.016	[0.006] -0.004 [0.010]	0.005]	[0.009] -0.011	[0.007] -0.005 [0.007]			
	[0.016] [0.013] [0.010] [0.006] [0.009] [0.00 How do you assess the work of prime minister Vladimir Putin								
	Good and	Good and	Good and	Bad, but	Bad and	Bad and			
	getting better	remains the same	getting worse	getting better	remains the same	getting worse			
Log (number of VK users), Aug 2011	0.163*	-0.062	0.008	-0.053	-0.054	-0.007			
Log (SPbSU students), one cohort younger than VK founder	[0.095] -0.017	[0.104] 0.011	0.001	[0.033]	0.062]	0.048]			
Log (SPbSU students), one cohort older than VK founder	[0.016] -0.006 [0.016]	[0.008] -0.022 [0.014]	[0.005] -0.009 [0.007]	[0.003] 0.005 [0.005]	[0.008] -0.003 [0.010]	[0.006] -0.003 [0.007]			
	How do you assess the work of the government								
	Good and getting better	Good and remains the same	Good and getting worse	Bad, but getting better	Bad and remains the same	Bad and getting worse			
Log (number of VK users), Aug 2011	0.258***	0.090	-0.104*	-0.069	-0.064	-0.017			
Log (SPbSU students), one cohort younger than VK founder	[0.097] -0.013	[0.105] 0.018	0.003	[0.064] 0.012**	[0.088] -0.003	[0.077] -0.001			
Log (SPbSU students), one cohort older than VK founder	[0.017] -0.013 [0.017]	[0.013] -0.026 [0.016]	[0.007] 0.005 [0.011]	[0.006] 0.005 [0.009]	[0.011] -0.014 [0.010]	[0.009] 0.001 [0.010]			

### Fractionalization

- People in the same city can join several online social networks and usually use only one intensively
- Other things being equal, cities with more fracitonalized networks are less likely to experience mass protests
  - ▶ with unexpected protests, coordination is more difficult
  - ► social pressure is smaller
- Two online social networks very similar in terms of functions and even colors of interface: Facebook and VKontakte



### Channels: fractionalization

Panel A. Network fractionalization and protest participa	tion.							
				December 20				
		Whole sample					n 100 000 i	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fractionalization of social media networks (Facebook+Vkontakte)	-0.903 [0.670]	-1.009 [0.685]	-0.914 [0.687]	-0.906 [0.674]	-3.193** [1.420]	-3.973** [1.592]	-2.761* [1.507]	-3.553** [1.557]
Log (number of users in both networks)	1.722*** [0.321]	1.697*** [0.312]	1.682*** [0.319]	1.731*** [0.315]	1.404**	1.324**	1.606***	1.615***
Population controls	Yes***	Yes***	Yes***	Yes***	Yes**	Yes**	Yes**	Yes**
Age cohort controls	Yes**	Yes**	Yes**	Yes**	Yes**	Yes	Yes**	Yes***
Education controls Electoral controls, 1995	Yes	Yes Yes*	Yes	Yes	Yes	Yes Yes	Yes	Yes
Electoral controls, 1999		103	Yes*			103	Yes*	
Electoral controls, 2003			100	Yes*			100	Yes
Observations	625	625	625	625	158	158	158	158
R-squared	0.832	0.834	0.836	0.834	0.817	0.832	0.833	0.833
Panel B. Network fractionalization and the incidence of	protest							
			Incidence of	protests in De	ecember 201	1 (dummy)		
		Whole	sample		Cities w	ith more tha	n 100 000 i	nhabitants
Fractionalization of social media networks (Facebook+Vkontakte)	-0.132 [0.135]	-0.148 [0.135]	-0.135 [0.135]	-0.129 [0.136]	-0.656** [0.313]	-0.702** [0.307]	-0.578* [0.307]	-0.723** [0.321]
Log (number of users in both networks)	0.266*** [0.063]	0.262*** [0.061]	0.259*** [0.061]	0.264*** [0.061]	0.148	0.156 [0.103]	0.177	0.203*
Population controls	Yes***	Yes***	Yes***	Yes***	Yes**	Yes***	Yes**	Yes***
Age cohort controls	Yes**	Yes**	Yes**	Yes**	Yes***	Yes*	Yes**	Yes***
Education controls	Yes*	Yes*	Yes*	Yes*	Yes	Yes*	Yes**	Yes*
Electoral controls, 1995		Yes*				Yes		
Electoral controls, 1999			Yes				Yes	
Electoral controls, 2003				Yes**				Yes**
Observations	625	625	625	625	158	158	158	158
R-squared	0.780	0.784	0.784	0.784	0.767	0.789	0.784	0.796

## Conclusions

- Evidence consistent with social media boosting protest participation
  - ► Cross-city results for the leading Russian social network, VKontakte
  - ► Use overtime student flows fluctuations for identification
- Consistent with reducing the costs of collective action
  - ► More pro-government vote with social media
  - ► Fractionalization is important
  - ► Diminishing effect over time

