Online Correction to "Social Media and Protest Participation: Evidence from Russia"

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This document corrects an error in the construction of two control variables used in Enikolopov et al. (2020). While working on a new project that uses data from Enikolopov et al. (2020) it was noticed that the coordinates of 58 out of 625 cities in the sample were incorrect. As a result, two of the control variables used in the paper—spherical distances to Moscow and Saint Petersburg— were computed erroneously. Since these control variables were part of the baseline specification, the authors feel the need to issue a correction.

In this online correction, we proceed as follows. In Section 1, we describe the issue of near multicollinearity that arises once one uses the corrected city coordinates and argue that the underlying cause is near multicollinearity rather than a substantive relation between the instrument and the endogenous variable. In Section 2, we propose alternative approaches to solve this issue and indicate our preferred correction; all results remain qualitatively unchanged.

1 The Issue

The initial problem stems from a coding mistake that truncated the coordinates for 58 out of 625 cities in our sample, which led to incorrect calculations of two control variables: spherical distances to Moscow and Saint Petersburg. Once these distances are recalculated using the correct coordinates, they become almost perfectly correlated, with the correlation coefficient of 0.98. If one uses the corrected control variables in the analysis, the coefficient for the instrument in a first-stage regression shrinks in magnitude and becomes not statistically significant (see Table 1 below, which corresponds to Table I in Enikolopov et al., 2020). In the original article, the coefficient in column (5) of Table I was 0.1323 with the effective F-statistics (Olea and Pflueger, 2013) of 10.97 (see column (1) in Table II in the original article). With corrected coordinates, the coefficient falls to 0.0287 and the effective F-statistics falls to around 0.698 (column (5) in Table 1 and column (1) in Table 2, respectively). At the same time, the reduced form results remain similar—see Table 2 that corresponds to Table SA.I in the Supplementary materials to Enikolopov et al. (2020). However, the substantially weakened first stage adversely impacts all the subsequent IV-based estimates (see Table 3 that corresponds to Table II in Enikolopov et al. (2020)).

We believe that the weakened first stage is due to a technical issue of near-multicollinearity caused by the inclusion of two almost perfectly correlated control variables (Farrar and Glauber, 1967) rather than a substantive problem caused by the fact that controlling for these two variables captures some important relationship between the instrument and the endogenous variable.

There are several reasons why we think that this is a technical rather than a substantive issue. First, when one of the authors originally tried to replicate the results with the corrected spherical distances, the author received an error message about a highly singular matrix. The estimator started converging only after an overall update to all STATA packages.

Second, we observe that the Kleibergen-Paap and effective F-statistics for the instrument increase if we mechanically reduce the correlation between the two distances by adding randomly generated noise to one of these variables.[1] Table 4 shows that the effective F-statistics rises from around 0.7 to 10–11, i.e., close to the level reported in Enikolopov et al. (2020). Furthermore, Table 5 shows that the addition of Gaussian noise restores the baseline results in Enikolopov et al. (2020).

Finally, Table 6 below shows that the results are very close to those reported in the paper if one uses only one of the two distances as a control variable, or their average, or the first principal component of the two variables, or their minimum or maximum—all of which are the recommendations in the case of near-multicollinearity.

2   Proposed alternatives

As mentioned in the previous section, one of the natural solutions to the near-collinearity issue is to leave as a control variable only one of the spherical distances—to Moscow or Saint Petersburg. The latter option is probably easiest to justify as the VK founder studied in Saint Petersburg and, thus, distance to Saint Petersburg accounts for a student's cost of physically reaching Saint Petersburg State University from their hometowns.

Our preferred solution, however, is to replace the spherical distances with the driving distances to the same two cities.[2] There are two reasons for that. First, due to the poor state of air transportation in Russia at the time, this variable is arguably more likely to capture the difficulty of getting to Moscow or Saint Petersburg by the students as compared with the spherical distance initially used in the analysis. The first stage in this specification is stronger than in Enikolopov et al. (2020) (see Tables 7–8 relative to Tables I–II in the original manuscript), which might reflect the fact that students indeed traveled by road rather than by air at that time. In particular, the first-stage coefficient of 0.1323 in column (5) of Table I of the original article increases to 0.1415 in column (5) of Table 7, and the effective F-statistics increases from 10.97 in column (1) of Table II in the original article to 14.41 in column (1) of Table 8.

Second, this approach minimizes the difference with the published paper since it only changes the definition of the distance variables used in the analysis and not their composition.

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[1]In particular, we add to the distance to Saint Petersburg a Gaussian noise with a mean zero and a standard deviation varying from one to that of the corrected spherical distance variable (1,462).

[2]To calculate the driving distances, we use information from the website `https://perevozka24.ru/rastoyanie`. For the seven cities that are not connected to Moscow and Saint Petersburg (including the three cities in Yamalo-Nenets autonomous okrug that were connected after the period of analysis), we use an arbitrary high number calculated as twice the maximum driving distance observed in the sample. The results are robust to alternative ways of correcting for non-connected cities using different multiples of the maximum driving distance.

Results that use driving distance to Moscow and Saint Petersburg as the control variables are very close to the results reported in Enikolopov et al. (2020) both in terms of magnitudes and their statistical significance (see Tables 7–10 below).[3]. E.g., the coefficient for the effect of the number of VK users on the incidence of protests reduces from 0.466 in the original paper (see column (1) of Table II) to 0.430 (see column (1) in Table 8) and remains statistically significant. The coefficient for the effect on Voting for Putin in the 2012 elections decreases from 0.152 (see column (1) in Table III in the original paper) to 0.100 (see column (1) in Table 9) but remains statistically significant.

The results are also robust to controlling for inaccessible city indicators, as well as indicators for accessible but remote cities located in the Far East, Siberia, and North Caucasus.

3 Conclusion

In this correction, we identify the mistake in the calculation of the two control variables in Enikolopov et al. (2020)—the distance to Moscow and Saint Petersburg—that causes the problem of near-multicollinearity. Our preferred correction is to use the driving distances to Moscow and Saint Petersburg instead of the spherical distances. The results using the driving distances to Moscow and Saint Petersburg as the control variables are very close to the results reported in Enikolopov et al. (2020) both in terms of magnitudes and their statistical significance.

References

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[3]Note that the results remain robust despite the fact that driving distance to Moscow and Saint Petersburg are also extremely highly correlated.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Log (number of VK users), June 2011							
Log (SPbSU students), same 5-year cohort as VK founder	0.5006	0.1715	0.1749	0.0552	0.0287	0.0287	0.0365	0.0326
	[0.1381]	[0.0441]	[0.0442]	[0.0405]	[0.0400]	[0.0397]	[0.0390]	[0.0415]
Log (SPbSU students), one cohort younger than VK founder	0.5612	-0.0267	-0.0323	-0.0102	-0.0396	-0.0388	-0.0386	-0.0375
	[0.1040]	[0.0508]	[0.0522]	[0.0326]	[0.0322]	[0.0329]	[0.0322]	[0.0322]
Log (SPbSU students), one cohort older than VK founder	0.3687	0.1040	0.0945	-0.0370	-0.0429	-0.0390	-0.0398	-0.0376
	[0.1726]	[0.0459]	[0.0448]	[0.0410]	[0.0386]	[0.0396]	[0.0374]	[0.0376]
Regional center			0.1992	0.3939	0.1522	0.1484	0.1571	0.1689
			[0.1115]	[0.1251]	[0.1292]	[0.1272]	[0.1265]	[0.1309]
Rayon center (county seat)				0.0391	0.0078	0.0160	0.0280	0.0041
				[0.0640]	[0.0548]	[0.0550]	[0.0567]	[0.0540]
Distance to Saint Petersburg, km				-0.0005	-0.0008	-0.0008	-0.0008	-0.0008
				[0.0002]	[0.0001]	[0.0001]	[0.0001]	[0.0001]
Distance to Moscow, km				0.0003	0.0006	0.0006	0.0005	0.0006
				[0.0002]	[0.0001]	[0.0001]	[0.0001]	[0.0001]
Log (average wage), city-level, 2011				0.2915	0.3260	0.3501	0.3401	0.3106
				[0.1228]	[0.1270]	[0.1324]	[0.1122]	[0.1127]
Presence of a university in a city, 2011					0.1559	0.1590	0.1426	0.1628
					[0.0935]	[0.0935]	[0.0929]	[0.0933]
Internet penetration, region-level, 2011					-0.0490	-0.0202	0.0004	0.0254
					[0.1630]	[0.1576]	[0.1552]	[0.1641]
Log (number of Odnoklassniki users), 2014					0.2380	0.2315	0.2252	0.2345
					[0.0820]	[0.0808]	[0.0824]	[0.0832]
Ethnic fractionalization, 2010					0.6330	0.6892	0.6977	0.5716
					[0.2181]	[0.2107]	[0.2034]	[0.1729]
Observations	625	625	625	625	625	625	625	625
R-squared	0.4428	0.8606	0.8614	0.9251	0.9336	0.9351	0.9355	0.9358
Mean of the dependent variable	9.536	9.536	9.536	9.536	9.536	9.536	9.536	9.536
SD of the dependent variable	1.334	1.334	1.334	1.334	1.334	1.334	1.334	1.334
Population controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age cohort controls				Yes	Yes	Yes	Yes	Yes
Education controls				Yes	Yes	Yes	Yes	Yes
Electoral controls, 1995						Yes		
Electoral controls, 1999							Yes	
Electoral controls, 2003								Yes
p-value for equality of coefficients for three cohorts	0.706	0.044	0.038	0.276	0.316	0.345	0.267	0.353
p-value for equality of coefficients of Durov's and younger cohort	0.762	0.014	0.011	0.139	0.142	0.155	0.114	0.158
p-value for equality of coefficients of Durov's and older cohort	0.583	0.367	0.279	0.175	0.259	0.297	0.224	0.275

Notes: The table displays an issue with replicating Table I from Enikolopov et al. (2020) with corrected city coordinates and spherical distances to Moscow and Saint Petersburg. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. "Yes" is added to indicate inclusion of a group of controls. Population controls correspond to a 5th polynomial of city population. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), and electoral turnout for a corresponding year.

Table 2. Student Cohorts and Protest Participation in 2011. Corrected spherical distances.

	Incidence of protests, dummy, Dec 2011				Log (number of protesters), Dec 2011			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (SPbSU students), same 5-year cohort as VK founder	0.059	0.060	0.063	0.062	0.218	0.222	0.240	0.236
	[0.021]	[0.020]	[0.021]	[0.021]	[0.119]	[0.117]	[0.119]	[0.121]
Log (SPbSU students), one cohort younger than VK founder	0.011	0.010	0.009	0.012	0.149	0.145	0.135	0.158
	[0.020]	[0.019]	[0.020]	[0.020]	[0.103]	[0.102]	[0.104]	[0.103]
Log (SPbSU students), one cohort older than VK founder	-0.019	-0.017	-0.018	-0.016	-0.103	-0.094	-0.096	-0.091
	[0.020]	[0.021]	[0.021]	[0.021]	[0.112]	[0.113]	[0.112]	[0.112]
Regional center	-0.015	-0.011	-0.006	-0.010	0.272	0.290	0.321	0.292
	[0.099]	[0.097]	[0.096]	[0.098]	[0.494]	[0.484]	[0.486]	[0.491]
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
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Rayon center (county seat)	-0.001	0.002	-0.007	-0.008	0.009	0.023	-0.018	-0.032
	[0.009]	[0.010]	[0.010]	[0.011]	[0.044]	[0.049]	[0.050]	[0.057]
Log (average wage), city-level, 2011	0.026	0.046	0.015	-0.002	0.158	0.235	0.100	0.032
	[0.034]	[0.036]	[0.035]	[0.033]	[0.178]	[0.186]	[0.194]	[0.180]
Presence of a university in a city, 2011	0.198	0.195	0.194	0.198	0.883	0.876	0.858	0.895
	[0.099]	[0.098]	[0.097]	[0.099]	[0.428]	[0.427]	[0.424]	[0.435]
Internet penetration, region-level, 2011	-0.019	0.004	-0.008	-0.017	0.061	0.143	0.115	0.067
	[0.046]	[0.045]	[0.054]	[0.048]	[0.250]	[0.237]	[0.275]	[0.254]
Log (number of Odnoklassniki users), 2014	0.034	0.026	0.038	0.034	0.153	0.120	0.169	0.160
	[0.019]	[0.021]	[0.021]	[0.020]	[0.121]	[0.129]	[0.129]	[0.125]
Ethnic fractionalization, 2010	-0.084	-0.077	-0.081	-0.081	-0.501	-0.436	-0.481	-0.511
	[0.061]	[0.063]	[0.065]	[0.063]	[0.328]	[0.343]	[0.349]	[0.350]
Observations	625	625	625	625	625	625	625	625
R-squared	0.776	0.780	0.780	0.781	0.824	0.826	0.828	0.827
Mean of the dependent variable	0.134	0.134	0.134	0.134	0.773	0.773	0.773	0.773
SD of the dependent variable	0.341	0.341	0.341	0.341	2.024	2.024	2.024	2.024
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
p-value for equality of coefficients for three cohorts	0.0883	0.0813	0.0616	0.0866	0.253	0.276	0.255	0.250
p-value for equality of coefficients of Durov's and younger coho	0.113	0.0894	0.0739	0.107	0.674	0.632	0.521	0.640
p-value for equality of coefficients of Durov's and older cohort	0.0330	0.0348	0.0262	0.0331	0.124	0.127	0.108	0.119

Notes: The table displays robustness of Table SA.I in Enikolopov et al. (2020) to correcting city coordinates and the corresponding spherical distances to Moscow and Saint Petersburg. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. "Yes" is added to indicate inclusion of a group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), and electoral turnout for a corresponding year.

Table 3. VK Penetration and Protest Participation in 2011. Corrected spherical distances.

Panel A. Probability of protests

	Incidence of protests, dummy, Dec 2011							
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (number of VK users), June 2011	2.059	2.084	1.736	1.895	0.067	0.063	0.064	0.064
	[2.523]	[2.535]	[1.629]	[2.112]	[0.020]	[0.021]	[0.021]	[0.020]
Weak IV Robust 95% Confidence Interval	entire grid	entire grid	entire grid	entire grid				
Log (SPbSU students), one cohort younger than VK founder	0.093	0.091	0.076	0.083	0.029	0.028	0.027	0.030
	[0.127]	[0.125]	[0.087]	[0.104]	[0.021]	[0.020]	[0.021]	[0.020]
Log (SPbSU students), one cohort older than VK founder	0.069	0.064	0.051	0.055	0.004	0.007	0.006	0.007
	[0.115]	[0.107]	[0.077]	[0.090]	[0.018]	[0.018]	[0.018]	[0.019]
Observations	625	625	625	625	625	625	625	625
Mean of the dependent variable	0.134	0.134	0.134	0.134	0.134	0.134	0.134	0.134
SD of the dependent variable	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341
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
Kleibergen-Paap F-stat	0.517	0.522	0.877	0.620				
Effective F-stat (Montiel Olea and Pflueger 2013)	0.698	0.699	1.136	0.909				

Panel B. Number of protesters

	Log (number of protesters), Dec 2011							
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (number of VK users), June 2011	7.582	7.733	6.556	7.220	0.369	0.346	0.353	0.355
	[9.439]	[9.531]	[6.389]	[8.197]	[0.116]	[0.121]	[0.124]	[0.121]
Weak IV Robust 95% Confidence Interval	entire grid	entire grid	(0.202, ∞)	entire grid				
Log (SPbSU students), one cohort younger than VK founder	0.450	0.445	0.388	0.428	0.219	0.215	0.208	0.229
	[0.468]	[0.464]	[0.336]	[0.399]	[0.108]	[0.107]	[0.109]	[0.107]
Log (SPbSU students), one cohort older than VK founder	0.222	0.207	0.165	0.181	-0.013	-0.004	-0.002	0.001
	[0.416]	[0.391]	[0.289]	[0.336]	[0.093]	[0.094]	[0.092]	[0.094]
Observations	625	625	625	625	625	625	625	625
Mean of the dependent variable	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773
SD of the dependent variable	2.024	2.024	2.024	2.024	2.024	2.024	2.024	2.024
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
Kleibergen-Paap F-stat	0.517	0.522	0.877	0.620				
Effective F-statistics (Olea Montiel and Pflueger 2013)	0.698	0.699	1.136	0.909				

Notes: The table displays an issue with replicating Table II from Enikolopov et al. (2020) with corrected city coordinates and spherical distances to Moscow and Saint Petersburg. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. "Yes" is added to indicate inclusion of a group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), and electoral turnout for a corresponding year. Other controls include dummy for regional and county centers, distances to Moscow and St Petersburg, log (average wage), share of people with higher education in 2002, internet penetration in 2011, log (Odnoklassniki users in 2014). Weak IV robust 95% confidence intervals are Anderson-Rubin confidence sets calculated using software in Finlay and Magnusson (2009), which accommodates heteroskedasticity.

Table 4. Determinants of VK Penetration in 2011 (First Stage Regression). Adding Gaussian Noise to Cities' Distances to Saint Petersburg.

	Log (number of VK users), June 2011				
Gaussian noise SD	*1*	*100*	*500*	*1000*	*1462*
	(1)	(2)	(3)	(4)	(5)
Log (SPbSU students), same 5-year cohort as VK founder	0.0285	0.0621	0.1153	0.1163	0.1222
	[0.0400]	[0.0409]	[0.0482]	[0.0495]	[0.0483]
Log (SPbSU students), one cohort younger than VK founder	-0.0397	-0.0335	-0.0355	-0.0290	-0.0303
	[0.0322]	[0.0333]	[0.0335]	[0.0327]	[0.0329]
Log (SPbSU students), one cohort older than VK founder	-0.0428	-0.0078	0.0478	0.0564	0.0588
	[0.0386]	[0.0396]	[0.0400]	[0.0385]	[0.0393]
Regional center	0.1519	0.1752	0.2952	0.3222	0.3034
	[0.1292]	[0.1254]	[0.1170]	[0.1157]	[0.1198]
Rayon center (county seat)	0.0077	0.0192	0.0445	0.0539	0.0470
	[0.0547]	[0.0575]	[0.0647]	[0.0668]	[0.0661]
Distance to Saint Petersburg + Gaussian noise, km	-0.0008	-0.0005	-0.0001	-0.0000	-0.0000
	[0.0001]	[0.0001]	[0.0000]	[0.0000]	[0.0000]
Distance to Moscow, km	0.0006	0.0003	-0.0001	-0.0001	-0.0002
	[0.0001]	[0.0001]	[0.0000]	[0.0000]	[0.0000]
Log (average wage), city-level, 2011	0.3259	0.3894	0.5006	0.5114	0.5116
	[0.1269]	[0.1221]	[0.1185]	[0.1188]	[0.1186]
Presence of a university in a city, 2011	0.1563	0.1582	0.1155	0.0864	0.1008
	[0.0935]	[0.0918]	[0.0827]	[0.0822]	[0.0853]
Internet penetration, region-level, 2011	-0.0490	-0.0402	0.0050	0.0055	0.0092
	[0.1630]	[0.1517]	[0.1554]	[0.1591]	[0.1584]
Log (number of Odnoklassniki users), 2014	0.2378	0.1805	0.1196	0.1107	0.1030
	[0.0819]	[0.0795]	[0.0767]	[0.0761]	[0.0765]
Ethnic fractionalization, 2010	0.6329	0.5627	0.4232	0.4087	0.4126
	[0.2180]	[0.2258]	[0.2299]	[0.2293]	[0.2339]
Observations	625	625	625	625	625
R-squared	0.9336	0.9294	0.9252	0.9250	0.9244
Mean of the dependent variable	9.536	9.536	9.536	9.536	9.536
SD of the dependent variable	1.334	1.334	1.334	1.334	1.334
Population controls	Yes	Yes	Yes	Yes	Yes
Age cohort controls	Yes	Yes	Yes	Yes	Yes
Education controls	Yes	Yes	Yes	Yes	Yes
p-value for equality of coefficients for three cohorts	0.318	0.148	0.0277	0.0347	0.0245
p-value for equality of coefficients of Durov's and younger cohort	0.143	0.0518	0.0123	0.0155	0.0112
p-value for equality of coefficients of Durov's and older cohort	0.261	0.301	0.363	0.411	0.384
Kleibergen-Paap F-stat	0.509	2.297	5.719	5.517	6.396
Effective F-stat (Montiel Olea and Pflueger 2013)	0.687	3.129	10.885	11.026	12.083

Notes: The table shows that a replication issue with Table I from Enikolopov et al. (2020) is resolved simply by adding Gaussian noise with zero mean and sufficient variance to a city's spherical distance to Saint Petersburg. Table varies the standard deviation of this Gaussian noise from 1 In column (1) to 1462 in column (5), corresponding to the standard deviation of the corrected spherical distance variable to Saint Petersburg. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. "Yes" is added to indicate inclusion of a group of controls. Population controls correspond to a 5th polynomial of city population. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education.

Table 5. VK Penetration and Protest Participation in 2011. Adding Gaussian Noise to Cities' Distances to Saint Petersburg.

Panel A. Probability of protests

	Incidence of protests, dummy, Dec 2011							
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (number of VK users), June 2011	0.473	0.472	0.532	0.482	0.068	0.062	0.065	0.065
	[0.192]	[0.192]	[0.215]	[0.194]	[0.020]	[0.021]	[0.022]	[0.021]
Weak IV Robust 95% Confidence Interval	(0.18, 2.07)	(0.18, 2.23)	(0.20, 2.37)	(0.18, 1.99)				
Log (SPbSU students), one cohort younger than VK founder	0.028	0.028	0.029	0.030	0.031	0.030	0.029	0.032
	[0.024]	[0.023]	[0.026]	[0.025]	[0.021]	[0.021]	[0.021]	[0.021]
Log (SPbSU students), one cohort older than VK founder	-0.043	-0.044	-0.039	-0.044	0.005	0.005	0.006	0.007
	[0.030]	[0.031]	[0.029]	[0.031]	[0.016]	[0.016]	[0.016]	[0.016]
Observations	625	625	625	625	625	625	625	625
Mean of the dependent variable	0.134	0.134	0.134	0.134	0.134	0.134	0.134	0.134
SD of the dependent variable	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341
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
Kleibergen-Paap F-stat	6.396	6.241	6.427	6.431				
Effective F-stat (Montiel Olea and Pflueger 2013)	12.08	11.55	10.71	12.37				

Panel B. Number of protesters

	Log (number of protesters), Dec 2011							
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (number of VK users), June 2011	1.930	1.927	2.176	2.019	0.396	0.365	0.375	0.382
	[0.973]	[0.978]	[1.091]	[0.982]	[0.115]	[0.120]	[0.127]	[0.121]
Weak IV Robust 95% Confidence Interval	(0.02, 8.46)	(-0.02, ∞)	(0.08, ∞)	(0.14, 8.36)				
Log (SPbSU students), one cohort younger than VK founder	0.210	0.206	0.212	0.218	0.235	0.229	0.222	0.246
	[0.117]	[0.117]	[0.127]	[0.122]	[0.110]	[0.109]	[0.112]	[0.110]
Log (SPbSU students), one cohort older than VK founder	-0.197	-0.202	-0.174	-0.202	0.012	0.010	0.019	0.024
	[0.162]	[0.163]	[0.149]	[0.166]	[0.084]	[0.084]	[0.082]	[0.085]
Observations	625	625	625	625	625	625	625	625
Mean of the dependent variable	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773
SD of the dependent variable	2.024	2.024	2.024	2.024	2.024	2.024	2.024	2.024
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
Kleibergen-Paap F-stat	6.396	6.241	6.427	6.431				
Effective F-statistics (Olea Montiel and Pflueger 2013)	12.08	11.55	10.71	12.37				

Notes: The table shows that a replication issue with Table II from Enikolopov et al. (2020) is resolved simply by adding Gaussian noise with zero mean and sufficient variance to a city's spherical distance to Saint Petersburg. In this table, added noise's standard deviation is 1462 which corresponds to standard deviation of the corrected spherical distance variable to Saint Petersburg. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. "Yes" is added to indicate inclusion of a group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), and electoral turnout for a corresponding year. Other controls include dummy for regional and county centers, distances to Moscow and St Petersburg, log (average wage), share of people with higher education in 2002, internet penetration in 2011, log (Odnoklassniki users in 2014). Weak IV robust 95% confidence intervals are Anderson-Rubin confidence sets calculated using software in Finlay and Magnusson (2009), which accommodates heteroskedasticity.

Table 6. Determinants of VK Penetration in 2011 (First Stage Regression). Alternative Distance Controls.

	Log (number of VK users), June 2011					
	(1)	(2)	(3)	(4)	(5)	(6)
Log (SPbSU students), same 5-year cohort as VK founder	0.1200	0.0958	0.1082	0.1079	0.1095	0.1071
	[0.0486]	[0.0456]	[0.0471]	[0.0470]	[0.0472]	[0.0470]
Log (SPbSU students), one cohort younger than VK founder	-0.0276	-0.0298	-0.0286	-0.0286	-0.0274	-0.0299
	[0.0326]	[0.0322]	[0.0324]	[0.0324]	[0.0327]	[0.0320]
Log (SPbSU students), one cohort older than VK founder	0.0613	0.0371	0.0498	0.0495	0.0497	0.0499
	[0.0397]	[0.0388]	[0.0391]	[0.0391]	[0.0394]	[0.0390]
Regional center	0.3100	0.2799	0.2964	0.2959	0.2955	0.2968
	[0.1193]	[0.1203]	[0.1197]	[0.1197]	[0.1191]	[0.1204]
Rayon center (county seat)	0.0520	0.0493	0.0515	0.0515	0.0521	0.0502
	[0.0661]	[0.0624]	[0.0643]	[0.0642]	[0.0652]	[0.0633]
Log (average wage), city-level, 2011	0.5152	0.4986	0.5100	0.5098	0.5144	0.5030
	[0.1181]	[0.1197]	[0.1188]	[0.1188]	[0.1189]	[0.1186]
Presence of a university in a city, 2011	0.0946	0.1075	0.1006	0.1008	0.1045	0.0964
	[0.0853]	[0.0871]	[0.0861]	[0.0861]	[0.0864]	[0.0858]
Internet penetration, region-level, 2011	0.0065	-0.0211	-0.0081	-0.0084	-0.0136	-0.0008
	[0.1591]	[0.1542]	[0.1562]	[0.1562]	[0.1564]	[0.1564]
Log (number of Odnoklassniki users), 2014	0.1002	0.1384	0.1190	0.1195	0.1143	0.1236
	[0.0768]	[0.0782]	[0.0773]	[0.0773]	[0.0775]	[0.0772]
Ethnic fractionalization, 2010	0.4085	0.4728	0.4402	0.4411	0.4194	0.4620
	[0.2331]	[0.2281]	[0.2306]	[0.2306]	[0.2330]	[0.2282]
Distance to Saint Petersburg, km	-0.0002					
	[0.0000]					
Distance to Moscow, km		-0.0002				
		[0.0000]				
Average between distances to Moscow and Saint Petersburg			-0.0002			
			[0.0000]			
Principal component of distances to Moscow and Saint Petersburg				-0.2052		
				[0.0241]		
Minimum between distances to Moscow and Saint Petersburg					-0.0002	
					[0.0000]	
Maximum between distances to Moscow and Saint Petersburg						-0.0002
						[0.0000]
Observations	625	625	625	625	625	625
R-squared	0.9243	0.9282	0.9263	0.9263	0.9252	0.9273
Mean of the dependent variable	9.536	9.536	9.536	9.536	9.536	9.536
SD of the dependent variable	1.334	1.334	1.334	1.334	1.334	1.334
Population controls	Yes	Yes	Yes	Yes	Yes	Yes
Age cohort controls	Yes	Yes	Yes	Yes	Yes	Yes
Education controls	Yes	Yes	Yes	Yes	Yes	Yes
p-value for equality of coefficients for three cohorts	0.0295	0.0567	0.0402	0.0406	0.0440	0.0364
p-value for equality of coefficients of Durov's and younger cohort	0.0136	0.0225	0.0172	0.0173	0.0184	0.0160
p-value for equality of coefficients of Durov's and older cohort	0.422	0.400	0.414	0.413	0.404	0.423
Kleibergen-Paap F-stat	6.094	4.419	5.285	5.262	5.383	5.193
Effective F-stat (Montiel Olea and Pflueger 2013)	11.688	7.787	9.729	9.675	9.820	9.654

Notes: The table shows that a replication issue with Table I from Enikolopov et al. (2020) is resolved with alternative distance control compositions that alleviate the issue of near multicollinearity. Columns (1) and (2) leave only spherical distance to Saint Petersburg and Moscow, respectively. Column (3) includes a mean of the two distances, column (4) includes their principal component, and column (5) includes their minimum and column (6) includes their maximum. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. "Yes" is added to indicate inclusion of a group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education.

Table 7. Determinants of VK Penetration in 2011 (First Stage Regression). Preferred Specification with Driving Distances to Moscow and Saint Petersburg.

	Log (number of VK users), June 2011							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (SPbSU students), same 5-year cohort as VK founder	0.5006	0.1715	0.1749	0.1444	0.1415	0.1415	0.1545	0.1434
	[0.1381]	[0.0441]	[0.0442]	[0.0417]	[0.0426]	[0.0408]	[0.0424]	[0.0423]
Log (SPbSU students), one cohort younger than VK founder	0.5612	-0.0267	-0.0323	-0.0312	-0.0510	-0.0485	-0.0500	-0.0505
	[0.1040]	[0.0508]	[0.0522]	[0.0333]	[0.0328]	[0.0324]	[0.0333]	[0.0328]
Log (SPbSU students), one cohort older than VK founder	0.3687	0.1040	0.0945	-0.0071	-0.0060	-0.0097	-0.0087	-0.0091
	[0.1726]	[0.0459]	[0.0448]	[0.0440]	[0.0431]	[0.0421]	[0.0418]	[0.0417]
Regional center			0.1992	0.4209	0.2757	0.2857	0.2789	0.2704
			[0.1115]	[0.1227]	[0.1304]	[0.1293]	[0.1265]	[0.1295]
Rayon center (county seat)				0.0195	-0.0030	-0.0014	0.0096	-0.0063
				[0.0663]	[0.0621]	[0.0610]	[0.0638]	[0.0584]
Distance to Saint Petersburg, km				-0.0002	-0.0003	-0.0003	-0.0002	-0.0003
				[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]
Distance to Moscow, km				0.0001	0.0002	0.0002	0.0001	0.0003
				[0.0001]	[0.0001]	[0.0001]	[0.0001]	[0.0001]
Log (average wage), city-level, 2011				0.3152	0.3317	0.3231	0.2849	0.2916
				[0.1347]	[0.1411]	[0.1433]	[0.1277]	[0.1257]
Presence of a university in a city, 2011					0.0886	0.1076	0.0873	0.1152
					[0.0865]	[0.0866]	[0.0878]	[0.0865]
Internet penetration, region-level, 2011					-0.0312	-0.0270	-0.0441	0.0189
					[0.1892]	[0.1839]	[0.1923]	[0.1891]
Log (number of Odnoklassniki users), 2014					0.1138	0.1333	0.1199	0.1422
					[0.0780]	[0.0763]	[0.0779]	[0.0776]
Ethnic fractionalization, 2010					0.3789	0.4594	0.4980	0.3563
					[0.2442]	[0.2345]	[0.2327]	[0.1986]
Observations	625	625	625	625	625	625	625	625
R-squared	0.4428	0.8606	0.8614	0.9166	0.9201	0.9238	0.9230	0.9236
Mean of the dependent variable	9.536	9.536	9.536	9.536	9.536	9.536	9.536	9.536
SD of the dependent variable	1.334	1.334	1.334	1.334	1.334	1.334	1.334	1.334
Population controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age cohort controls				Yes	Yes	Yes	Yes	Yes
Education controls				Yes	Yes	Yes	Yes	Yes
Electoral controls, 1995						Yes		
Electoral controls, 1999							Yes	
Electoral controls, 2003								Yes
p-value for equality of coefficients for three cohorts	0.706	0.044	0.038	0.004	0.003	0.004	0.002	0.002
p-value for equality of coefficients of Durov's and younger cohort	0.762	0.014	0.011	0.001	0.001	0.001	0.000	0.001
p-value for equality of coefficients of Durov's and older cohort	0.583	0.367	0.279	0.038	0.042	0.028	0.024	0.030

Notes: The table displays the authors' preferred version of Table I from Enikolopov et al. (2020) with driving distances to Moscow and Saint Petersburg. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. "Yes" is added to indicate inclusion of a group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), and electoral turnout for a corresponding year.

Table 8. VK Penetration and Protest Participation in 2011. Preferred Specification with Driving Distances to Moscow and Saint Petersburg.

Panel A. Probability of protests

	Incidence of protests, dummy, Dec 2011							
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (number of VK users), June 2011	0.430	0.430	0.417	0.457	0.053	0.049	0.052	0.056
	[0.167]	[0.159]	[0.154]	[0.162]	[0.018]	[0.020]	[0.019]	[0.019]
Weak IV Robust 95% Confidence Interval	(0.16, 1.16)	(0.16, 1.06)	(0.16, 1.02)	(0.20, 1.12)				
Log (SPbSU students), one cohort younger than VK founder	0.032	0.030	0.029	0.034	0.027	0.026	0.025	0.028
	[0.025]	[0.024]	[0.025]	[0.026]	[0.020]	[0.020]	[0.021]	[0.020]
Log (SPbSU students), one cohort older than VK founder	-0.020	-0.017	-0.018	-0.016	-0.002	0.000	0.000	0.002
	[0.026]	[0.025]	[0.025]	[0.026]	[0.017]	[0.017]	[0.017]	[0.017]
Observations	625	625	625	625	625	625	625	625
Mean of the dependent variable	0.134	0.134	0.134	0.134	0.134	0.134	0.134	0.134
SD of the dependent variable	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341
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
Kleibergen-Paap F-stat	11.03	12.04	13.26	11.51				
Effective F-stat (Montiel Olea and Pflueger 2013)	14.41	14.94	17.51	15.19				

Panel B. Number of protesters

	Log (number of protesters), Dec 2011							
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (number of VK users), June 2011	1.762	1.766	1.744	1.913	0.337	0.309	0.328	0.346
	[0.845]	[0.821]	[0.776]	[0.830]	[0.108]	[0.114]	[0.115]	[0.114]
Weak IV Robust 95% Confidence Interval	(0.14, 5.05)	(0.18, 4.69)	(0.28, 4.51)	(0.32, 4.93)				
Log (SPbSU students), one cohort younger than VK founder	0.231	0.225	0.216	0.246	0.212	0.209	0.203	0.225
	[0.121]	[0.117]	[0.121]	[0.123]	[0.107]	[0.106]	[0.108]	[0.106]
Log (SPbSU students), one cohort older than VK founder	-0.096	-0.086	-0.086	-0.080	-0.028	-0.021	-0.015	-0.010
	[0.124]	[0.120]	[0.119]	[0.125]	[0.089]	[0.090]	[0.089]	[0.091]
Observations	625	625	625	625	625	625	625	625
Mean of the dependent variable	0.773	0.773	0.773	0.773	0.773	0.773	0.773	0.773
SD of the dependent variable	2.024	2.024	2.024	2.024	2.024	2.024	2.024	2.024
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
Kleibergen-Paap F-stat	11.03	12.04	13.26	11.51				
Effective F-statistics (Olea Montiel and Pflueger 2013)	14.41	14.94	17.51	15.19				

Notes: The table displays the authors' preferred version of Table I from Enikolopov et al. (2020) with driving distances to Moscow and Saint Petersburg. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Logarithm of any variable is calculated with 1 added inside. "Yes" is added to indicate inclusion of a group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), and electoral turnout for a corresponding year. Other controls include dummy for regional and county centers, distances to Moscow and St Petersburg, log (average wage), share of people with higher education in 2002, internet penetration in 2011, log (Odnoklassniki users in 2014). Weak IV robust 95% confidence intervals are Anderson-Rubin confidence sets calculated using software in Finlay and Magnusson (2009), which accommodates heteroskedasticity.

Table 9. VK Penetration and Voting Outcomes. Preferred Specification with Driving Distances to Moscow and Saint Petersburg.

	IV	IV	IV	IV	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Voting share for United Russia, 2007								
Log (number of VK users), June 2011	0.028	0.024	0.022	0.010	-0.022	-0.024	-0.016	-0.027
	[0.047]	[0.045]	[0.043]	[0.037]	[0.013]	[0.011]	[0.012]	[0.011]
Weak IV Robust 95% Confidence Interval	(-.08; .16)	(-.08; .14)	(-.08; .12)	(-.06; .12)				
Log (SPbSU students), one cohort younger than VK founder	-0.008	-0.005	-0.008	-0.006	-0.009	-0.005	-0.008	-0.007
	[0.008]	[0.007]	[0.008]	[0.007]	[0.008]	[0.007]	[0.008]	[0.007]
Log (SPbSU students), one cohort older than VK founder	0.002	0.002	-0.000	-0.001	0.005	0.004	0.002	0.001
	[0.007]	[0.006]	[0.007]	[0.006]	[0.007]	[0.006]	[0.007]	[0.006]
Voting share for Medvedev, 2008								
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
Log (number of VK users), June 2011	0.107	0.109	0.111	0.095	-0.004	-0.010	-0.001	-0.011
	[0.056]	[0.057]	[0.049]	[0.051]	[0.013]	[0.012]	[0.012]	[0.010]
Weak IV Robust 95% Confidence Interval	(.002; .30)	(.02; .32)	(.02; .28)	(.02; .28)				
Log (SPbSU students), one cohort younger than VK founder	-0.006	-0.004	-0.006	-0.004	-0.007	-0.004	-0.007	-0.005
	[0.009]	[0.008]	[0.008]	[0.007]	[0.008]	[0.007]	[0.007]	[0.006]
Log (SPbSU students), one cohort older than VK founder	-0.001	-0.002	-0.005	-0.004	0.005	0.004	0.002	0.001
	[0.008]	[0.007]	[0.008]	[0.007]	[0.007]	[0.006]	[0.007]	[0.006]
Voting share for United Russia, 2011								
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
Log (number of VK users), June 2011	0.189	0.167	0.171	0.148	-0.041	-0.041	-0.030	-0.045
	[0.113]	[0.106]	[0.099]	[0.100]	[0.017]	[0.017]	[0.016]	[0.015]
Weak IV Robust 95% Confidence Interval	(.002; .64)	(-.02; .58)	(.002; .52)	(-.02; .54)				
Weak IV Robust 90% Confidence Interval	(.02; .48)	(.02; .44)	(.04; .42)	(.02; .42)				
Log (SPbSU students), one cohort younger than VK founder	-0.004	0.002	-0.005	0.000	-0.005	0.001	-0.006	-0.002
	[0.014]	[0.012]	[0.013]	[0.011]	[0.012]	[0.011]	[0.012]	[0.011]
Log (SPbSU students), one cohort older than VK founder	0.005	0.009	0.002	0.001	0.018	0.020	0.013	0.011
	[0.013]	[0.011]	[0.012]	[0.011]	[0.012]	[0.011]	[0.012]	[0.011]
Voting Share for Putin, 2012								
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
Log (number of VK users), June 2011	0.100	0.100	0.089	0.078	-0.017	-0.016	-0.013	-0.021
	[0.064]	[0.064]	[0.057]	[0.054]	[0.012]	[0.011]	[0.011]	[0.009]
Weak IV Robust 95% Confidence Interval	(.002; .34)	(.002; .34)	(.002; .28)	(.002; .28)				
Log (SPbSU students), one cohort younger than VK founder	-0.001	0.001	-0.001	0.000	-0.002	0.000	-0.002	-0.001
	[0.009]	[0.008]	[0.009]	[0.007]	[0.008]	[0.007]	[0.008]	[0.007]
Log (SPbSU students), one cohort older than VK founder	0.005	0.005	0.002	0.002	0.011	0.011	0.008	0.007
	[0.009]	[0.009]	[0.008]	[0.008]	[0.007]	[0.007]	[0.008]	[0.007]
Voting share for United Russia, 2016								
	IV	IV	IV	IV	OLS	OLS	OLS	OLS
Log (number of VK users), June 2011	0.148	0.128	0.118	0.092	-0.001	0.009	0.014	-0.000
	[0.091]	[0.090]	[0.077]	[0.066]	[0.019]	[0.019]	[0.018]	[0.013]
Weak IV Robust 95% Confidence Interval	(-.02; .46)	(-.06; .42)	(-.04; .34)	(-.02; .32)				
Weak IV Robust 90% Confidence Interval	(.002; .36)	(-.02; .34)	(.002; .28)	(.002; .24)				
Log (SPbSU students), one cohort younger than VK founder	-0.001	0.005	-0.002	0.001	-0.002	0.004	-0.003	0.000
	[0.012]	[0.010]	[0.012]	[0.009]	[0.012]	[0.009]	[0.011]	[0.009]
Log (SPbSU students), one cohort older than VK founder	0.007	0.012	0.003	0.004	0.015	0.018	0.009	0.009
	[0.011]	[0.011]	[0.011]	[0.009]	[0.011]	[0.011]	[0.011]	[0.009]
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
Kleibergen-Paap F-stat	11.07	11.57	12.88	11.34				
Effective F-statistics (Olea Montiel and Pflueger 2013)	14.31	14.49	16.62	15.07				

Notes: The table displays the authors' preferred version of Table I from Enikolopov et al. (2020) with driving distances to Moscow and Saint Petersburg. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is a city. Since the outcomes are shares of population, population weights are applied. Logarithm of any variable is calculated with 1 added inside. "Yes" is added to indicate inclusion of a group of controls. Flexible controls for population (5th polynomial) are included in all specifications. Age cohort controls include the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, in each city according to 2010 Russian Census. Education controls include the share of population with higher education overall according to 2002 Russian Census and separately in each of the age cohorts according to 2010 Russian Census, to account for both the levels and the change in education. Electoral controls include vote for Yabloko party, Communist Party (KPRF), LDPR party, the ruling party (Our Home is Russia in 1995, Unity in 1999, United Russia in 2003), and electoral turnout for a corresponding year. Other controls include dummy for regional and county centers, distances to Moscow and St Petersburg, log (average wage), share of people with higher education in 2002, internet penetration in 2011, log (Odnoklassniki users in 2014). Weak IV robust 95% confidence intervals are Anderson-Rubin confidence sets calculated using software in Finlay and Magnusson (2009), which accommodates heteroskedasticity.

Table 10. VK Penetration and Political Attitudes. Preferred Specification with Driving Distances to Moscow and Saint Petersburg.

	How do you assess the work of president Dmitry Medvedev					
	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), June 2011	0.186	-0.075	0.001	-0.059	-0.022	0.014
	[0.090]	[0.111]	[0.060]	[0.047]	[0.063]	[0.048]
Log (SPbSU students), one cohort younger than VK founder	-0.012	0.009	0.002	0.012	0.002	0.005
	[0.013]	[0.008]	[0.006]	[0.004]	[0.009]	[0.008]
Log (SPbSU students), one cohort older than VK founder	-0.002	-0.017	-0.002	0.003	-0.016	-0.006
	[0.015]	[0.011]	[0.008]	[0.006]	[0.008]	[0.006]
	How do you assess the work of prime minister Vladimir Putin					
	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), June 2011	0.158	-0.052	0.033	-0.037	-0.072	-0.015
	[0.083]	[0.099]	[0.046]	[0.035]	[0.061]	[0.044]
Log (SPbSU students), one cohort younger than VK founder	-0.020	0.012	0.001	0.007	0.007	0.004
	[0.015]	[0.008]	[0.005]	[0.003]	[0.009]	[0.006]
Log (SPbSU students), one cohort older than VK founder	0.006	-0.023	-0.009	0.004	-0.011	-0.005
	[0.016]	[0.013]	[0.006]	[0.004]	[0.009]	[0.006]
	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), June 2011	0.246	0.075	-0.043	-0.054	-0.076	-0.038
	[0.092]	[0.094]	[0.057]	[0.065]	[0.081]	[0.069]
Log (SPbSU students), one cohort younger than VK founder	-0.016	0.018	0.003	0.013	-0.002	-0.000
	[0.015]	[0.012]	[0.006]	[0.006]	[0.012]	[0.009]
Log (SPbSU students), one cohort older than VK founder	-0.002	-0.018	0.006	0.003	-0.026	-0.002
	[0.016]	[0.013]	[0.009]	[0.008]	[0.010]	[0.009]
	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), June 2011	0.226	0.037	-0.042	-0.013	-0.001	-0.001
	[0.109]	[0.046]	[0.044]	[0.051]	[0.007]	[0.010]
Log (SPbSU students), one cohort younger than VK founder	-0.004	0.000	0.007	0.003	0.001	0.001
	[0.013]	[0.005]	[0.005]	[0.005]	[0.001]	[0.001]
Log (SPbSU students), one cohort older than VK founder	-0.022	-0.002	0.002	0.001	0.001	-0.002
	[0.019]	[0.006]	[0.007]	[0.006]	[0.001]	[0.002]
	Do you personally admit or exclude a possibility to take part in any protests					
	Admit	Exclude	Difficult to answer			
Log (number of VK users), June 2011	-0.156	0.050	0.112			
	[0.120]	[0.149]	[0.098]			
Log (SPbSU students), one cohort younger than VK founder	-0.003	-0.005	0.007			
	[0.012]	[0.015]	[0.009]			
Log (SPbSU students), one cohort older than VK founder	0.027	-0.030	0.002			
	[0.015]	[0.023]	[0.019]			

Notes: The table displays the authors' preferred version of Table I from Enikolopov et al. (2020) with driving distances to Moscow and Saint Petersburg. Robust standard errors in brackets are adjusted by clusters within regions. Unit of observation is an individual respondent. Survey weights are applied. Logarithm of any variable is calculated with 1 added inside. The table presents results of 27 separate IV regressions. All regressions include the following city-level controls:5th polynomial of population, the number of people aged 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and older years, the share of population with higher education in each of the age cohorts separately, dummy for regional and county centers , distances to Moscow and St Petersburg, log (average wage), share of population with higher education in 2002, internet penetration in 2011, log (Odnoklassniki users in 2014).