LOSS OF HUMAN CAPITAL AND DEVELOPMENT: EVIDENCE FROM RUSSIAN GERMANS REPATRIATION[1]

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VERY PRELIMINARY

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How important is human capital for development? Typically, researchers try to answer this question by studying human capital accumulation. We propose another approach, focusing on loss of human capital due to emigration. We exploit exogenous variation in feasibility of emigration for mostly rural inhabitants of the South-West Siberia arising from the repatriation program for people of German origin – the ethnic group widely believed to be hard working, thrifty and sober when compared to their Russian and other neighbors. Using municipality-level panel model approach, we show that rayons with greater presence of the Russian Germans (and, therefore, potential emigrants) in the census years (1989 and 2010) had higher agricultural productivity proxied by food staples output per ha. This implies that the German emigration led to decrease in agricultural productivity. The effect survives controlling for overall population dynamics and educational attainment, thus rendering agglomeration economies an implausible channel of influence.

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1. Introduction

Economic consequences of human capital are among most important topics in economics. Typically, scholars focus on studying human capital accumulation by means of education or immigration, and how human capital transmits into prosperity. We propose another approach, focusing on the loss of human capital due to emigration. Although it is well studied that immigration may bring substantial economic gains to a receiving country/region due to skills of immigrant population (Hornung, 2014), their human and social capital, as well as institutions of a sending country (Fulford et al., 2015, Rocah, 2015). However, much less studied are implications of human capital loss due to emigration for a sending country/region.

We exploit exogenous variation in feasibility of emigration for inhabitants of the South-West Siberia arising from the repatriation program for people of German origin implemented by the German government since late 1980s (people who returned to Germany under this program are known as *Spätaussiedler).* We restrict our attention to Altayskiy Kray and Omskaya Oblast - the two Russian administrative regions which hosted significant number of residents of German origin and for which we have gathered a unique dataset, including municipality-level demographics and agricultural statistics for the 2000th and late 1980s.

Ethnic Germans' colonies in Siberia were founded during the first half of the XX century based on both voluntary and forced migration from the Western areas of Russia, especially from Volga Region that had German colonies since XVIII century. A tremendous shock for the German community in Russia was the mass relocation to Siberia and Central Asia imposed by the Soviet government in 1941 as a response to the Nazi invasion of the USSR. Siberian Germans were mostly a rural minority, who typically lived in ethnic villages side by side with Russians, Ukrainians, Kazakhs, etc. Germans were generally believed by their neighbors to be hard working, thrifty and sober when compared to other ethnic groups.

Although the Federal Republic of Germany recognized the right of return since its foundation in 1949, the Soviet Union prevented Germans to leave the country until the advent of *Perestroika*. Since 1987, Soviet citizens of German origin and their family members got opportunity to resettle permanently to Germany, while people of other ethnic groups had no such option. In Altayskiy Kray and Omskaya Oblast the number of ethnic Germans plummeted from 262 thousand in 1989 to 156 thousand in 2002 and then to 101 thousand in 2010. In contrast, during the timespan between 1979 and 1989, when repatriation was impossible, the number of people of German origin in the two regions increased by 16 thousand.

Overall we test whether greater share of Russian Germans is associated with higher agricultural productivity and if so what are the mechanisms for the connection. Selection of agricultural productivity as a measure of overall economic efficiency is motivated by the fact

that most rayons with German colonies are rural, and the territory under consideration, Altayskiy kray and Omskaya oblast, have strong natural advantage in crop farming. Also, yield per ha is comparable between centrally planned and market economies, unlike monetary measures of productivity. Together with documented decline in Russian German's population, this could lead one to a conclusion that loss of human capital due to emigration of Russian Germans had economic consequences for the regions.

2. Data and Empirical Strategy

We build dataset for 91 municipalities of Altayskiy Kray and Omskaya Oblast. In doing so we combine information from several sources. First of all we use censuses of 1989 and 2010. 1989 census was chosen because it was the last Soviet census before start of the mass emigration; 2010 census refers to the period when lots of Russian Germans already left Russia so that we can expect effect from their emigration. Overall we collect census data on the total population, Russian Germans' population and educational attainment.

We use grain and potato yield per hectare as proxies for agricultural productivity and overall economic efficiency as most rayons with Germans' presence were rural. Potato is especially noteworthy because it is labor-intensive crop, therefore its yield should be especially responsive to changes in labor ethics. As Nunn and Qian (2011) show it played a crucial role in creating modern society through urbanization.

Data for grain and potato yield gathered for two periods that are most close to the censuses of 1989 and 2010: 1985-1990 and 2012-2014. Data for the first period come from Soviet-era publications (Narodnoye knoziaystvo…, 1986; Razvitiye agropromyshlennogo kompleksa…, 1990). Additional data were ordered from the Rosstat regional offices. For grain productivity, we average yield over 1985-1988 for Altayskiy kray and over 1985-1990 for Omskaya oblast. For potato productivity, we use average 1985-1988 data for Altayskiy kray and 1985 data for Omskaya oblast. Data for the second period were compiled from Rosstat municipal database for both regions and averaged over 2012 to 2014.

Overall the main variables are defined in table 1.

Table 1

Variable's short name	Variable's description
Germans	Share of people of German origin by rayon, per cent
Population	Total population by rayon, people
College	Share of people with college degree among those over 15, percent
Vocational school	Share of people with vocational degree among those over 15, percent
Grain yield	Farms' grain output , quintal per ha
Potato yield	Farms' potato output, quintal per ha

Descriptive statistics are reported in Table 2. We see that share of Germans decreased twofold between the two censuses. At the same time, educational attainment improved substantially. Grain yield per ha decreased slightly, while potato yield per ha grew more than twofold.

Table 2

Variable	Obs	Mean	Std. Dev.	Min	Max
1989 census					
Germans	91	6.19	7.15	0.47	49.02
Population	91	52,428	140,791	9,232	1,171,810
College	91	53.93	17.11	29.89	136.30
Vocational school	91	156.00	23.19	110.07	227.12
Grain yield	85	13.92	3.29	5.23	23.28
Potato yield	85	58.80	21.37	19.00	124.00
2010 census					
Germans	81	2.91	2.30	0.61	15.60
Population	91	47,754	138,936	6,302	1,154,116
College	88	103.61	30.59	52.40	275.00
Vocational school	88	275.66	38.99	217.00	426.50
Grain yield	88	12.32	2.97	5.17	20.66
Potato yield	90	134.69	23.89	48.50	251.83

To identify the effect of Russian Germans' presence on the economic efficiency of the territories we use a panel-model approach with two time periods and 91 municipalities for each period[2]. Thus we construct the following equation:

$$Y_{it} = \alpha_i + \lambda_t + G_{it}\rho + X_{it}\beta + \varepsilon_{it},$$

where G_{it} is a share of Germans in rayon i in period t, the variable that we are interested in, α_i represent rayon-level fixed effects, λ_t are effects for the first (i.e. 1989) and second (i.e. 2010) periods , X_{it} – additional controls, and ε_{it} is an error term.

3. Results

Our preliminary results displayed in Tables 3 and 4. Table 3 with potato yield per ha as a dependent variable indicates positive coefficient for the Germans' share of population. It's significant for both Altayskiy kray and Omskaya oblast and hold when controls for population dynamics and educational attainment added. Results are also robust for inclusion of logarithm of population and for dropping several metropolitan municipalities, which have little farming.

[2] Boundaries of administrative-territorial units underwent several alterations during the period of study, including carving out German ethnic rayons both in Altayskiy kray and Omskaya oblast in early 1990s. To ensure that changes in the rayons' boundaries do not affect the results, we amalgamate new rayons together with adjacent rayons that contributed territory to the new entities into time-invariant rayon groups.

Table 3

Dependent variable: Potato yield	(1)	(2)	(3)	(4)	(5)	(6)
	All rayons		Altayskiy kray		Omskaya oblast	
Germans	1.654**	1.577**	1.140***	1.225***	3.783*	3.716*
	(0.720)	(0.690)	(0.281)	(0.349)	(2.134)	(2.128)
College		-0.295		-0.279		-0.494
		(0.262)		(0.236)		(0.651)
Vocational school		-0.218		-0.286		0.027
		(0.164)		(0.184)		(0.223)
Population	$-7.14\cdot10^{-4}$	$-5.01\cdot10^{-4}$	$-7.55\cdot10^{-5}$	$-3.44\cdot10^{-6}$	0.003	0.004
	$(8.24\cdot10^{-4})$	$(7.11\cdot10^{-4})$	$(6.04\cdot10^{-4})$	$(5.71\cdot10^{-4})$	(0.002)	(0.003)
Period dummy	76.61***	117.7***	70.00***	118.1***	124.6***	149.6***
	(5.654)	(20.44)	(5.428)	(22.47)	(15.25)	(37.90)
Rayon dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	81.52**	122.3***	58.95**	117.2***	-135.3	-172.4
	(37.38)	(43.26)	(23.80)	(42.29)	(123.0)	(160.2)
Observations	166	164	117	115	49	49
R-squared	0.844	0.851	0.839	0.851	0.923	0.926

Robust standard errors clustered at the rayon level in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 represents patterns for grain yield per ha. Here the coefficient for Russian Germans share is positive for Omskaya oblast and insignificant for Altayskiy kray. Results are again robust for the same modifications of the model as described above.

Table 4

Dependent variable: Grain yield	(1)	(2)	(3)	(4)	(5)	(6)
	All rayons		Altayskiy kray		Omskaya oblast	
Germans	0.026	0.019	0.024	0.011	0.174***	0.180***
	(0.0602)	(0.0554)	(0.0376)	(0.0348)	(0.0552)	(0.0558)
College		-0.064***		-0.059***		-0.048
		(0.019)		(0.010)		(0.096)
Vocational school		0.026		0.026**		0.015
		(0.017)		(0.012)		(0.044)
Population	$-1.30\cdot10^{-4}$	$-7.47\cdot10^{-5}$	$1.94\cdot10^{-5}$	$5.86\cdot10^{-5}$*	$-6.83\cdot10^{-5}$	$2.77\cdot10^{-5}$
	$(1.42\cdot10^{-4})$	$(1.20\cdot10^{-4})$	$(2.96\cdot10^{-5})$	$(3.22\cdot10^{-5})$	$(1.75\cdot10^{-4})$	$(3.3\cdot10^{-4})$
Period dummy	-2.175***	-1.855	-3.078***	-3.070**	2.620**	3.645
	(0.662)	(2.326)	(0.367)	(1.429)	(0.974)	(2.686)
Rayon dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	19.82***	16.70***	14.09***	11.78***	14.89	9.038
	(6.366)	(6.102)	(1.105)	(2.549)	(10.41)	(22.03)
Observations	164	162	115	113	49	49
R-squared	0.235	0.303	0.695	0.773	0.522	0.539

Robust standard errors clustered at the rayon level in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4. Conclusions

In this paper, we study the consequences of emigration of the Russian Germans during 1990s-2000s for the sending communities. We use food staples yield (potato and grain) as a proxy for overall economic efficiency in the sending rayons, which are mostly rural and have natural advantage in farming. We show strong positive effect of German presence on potato productivity, and less consistent effect on grain productivity (although it is still positive and significant for one the regions considered, Omskaya oblast). This implies that the Germans emigration had negative impact on agricultural productivity.

The results are robust to controlling for total population and educational attainment. Therefore, agglomeration economies and formal education are unlikely to be underlying mechanisms in this case.

To this moment, we are unable to single out a precise mechanism of influence. Cultural traits, social capital and dimensions of human capital other than formal education (e.g. health) may be proposed as potential explanations to be investigated in the future. Also, we are going to consider alternative outcome variables.

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