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Falling Behind and Catching Up
Southeast Europe and East Central Europe in Comparison

June 23rd, 2016

Industrialization of the Russian Empire in the Nineteenth Century: In a Quest for the Regional Convergence

By Artem Kochnev

Gerschenkron, 1962

Economic Backwardness in Historical Perspective

A HISTORICAL approach to current problems calls perhaps for a word of explanation. Unlike so many of their predecessors, modern historians no longer announce to the world what inevitably will, or at least what ideally should, happen. We have grown modest. The prophetic fervor was bound to vanish together with the childlike faith in a perfectly comprehensible past whose flow was determined by some exceedingly simple and general historical law. Between Seneca's assertion of the absolute certainty of our knowledge of the past and Goethe's description of history as a book eternally kept under seven seals, between the *omnia certa sunt* of the one and the *ignorabimus* of the other, modern historical relativism moves gingerly. Modern historians realize full well that comprehension of the past — and that

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CONVERGENCE AND MODERNISATION*

Robert J. Barro

In a country panel since 1960, the estimated annual convergence rate for GDP is 1.7%, conditional on time-varying explanatory variables. With country fixed effects, the estimated convergence rate is misleadingly high. With data starting in 1870, country fixed effects are reasonable and the estimated convergence rate is 2.6%. Combining the two estimates suggests conditional convergence close to the 'iron-law' rate of 2%. With post-1960 data, estimation without country fixed effects reveals positive effects of GDP and schooling on law and order and democracy – consistent with the modernisation hypothesis. With post-1870 data, estimation without or with country fixed effects indicates modernisation.

According to the 'iron law of convergence', countries eliminate gaps in levels of real *per capita* GDP at a rate around 2% per year.[1] Convergence at a 2% rate implies that it takes 35 years for half of an initial gap to vanish and 115 years for 90% to disappear. Convergence-rate parameters are important to pin down because they provide guidance on how fast countries like China and India are likely to catch up to richer countries. The convergence rate may also reveal how fast a poor African country could develop or how rapidly North Korea could catch up to South Korea, and so on.

Empirically, the iron law takes the form of unconditional or absolute convergence in some samples of economies; those that are reasonably homogeneous in terms of long-run or steady-state characteristics. For example, a roughly 2% convergence rate emerged for *per capita* personal income in a long-term panel of US states in Barro and Sala-i-Martin (1992).[2] This convergence was absolute in the sense of not having to be conditioned on a set of variables that capture differences in long-run positions. The

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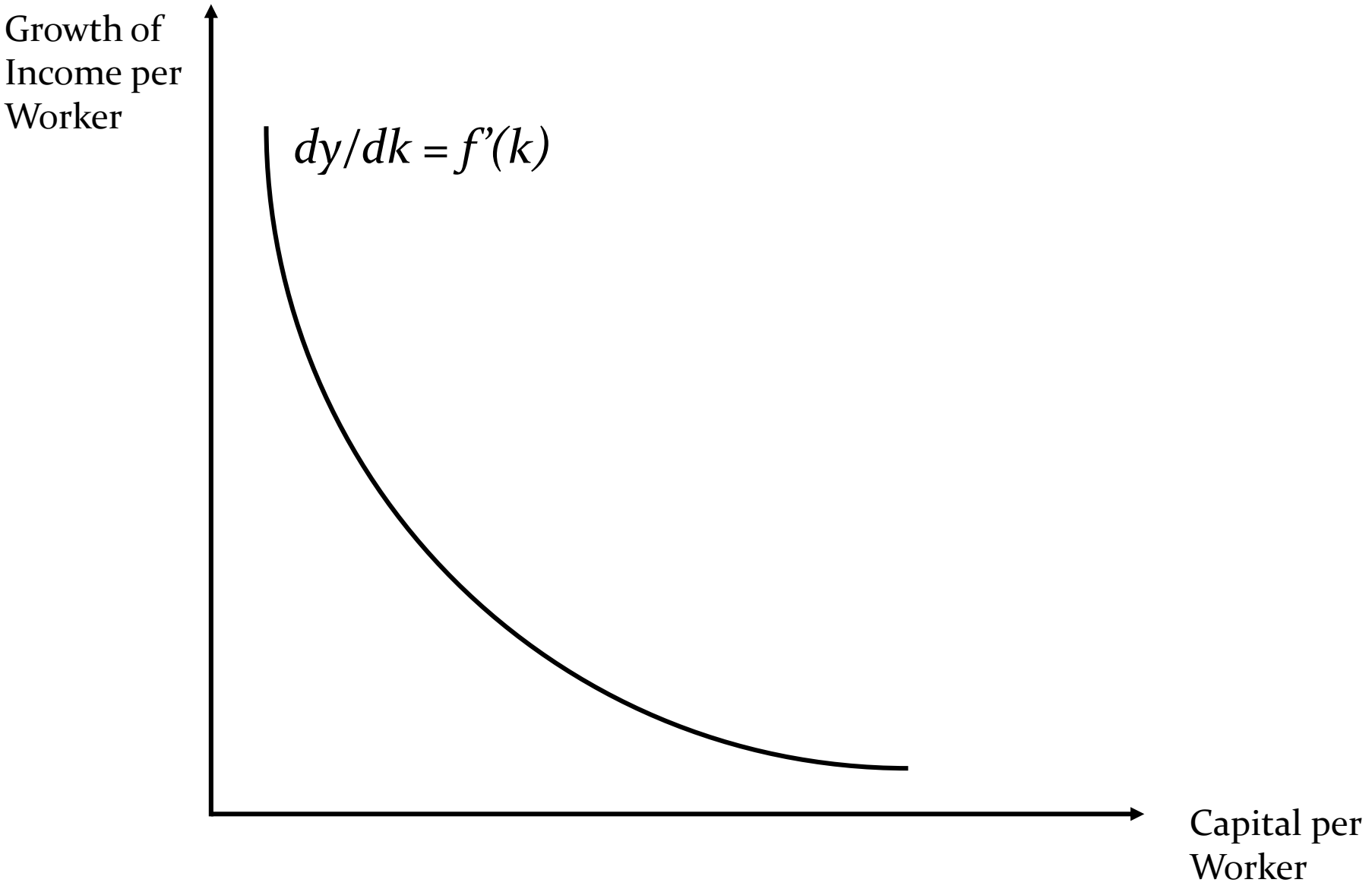
Growth of Income per Worker
Capital per Worker


Growth of Income per Worker
dy/dk = f'(k)
Capital per Worker

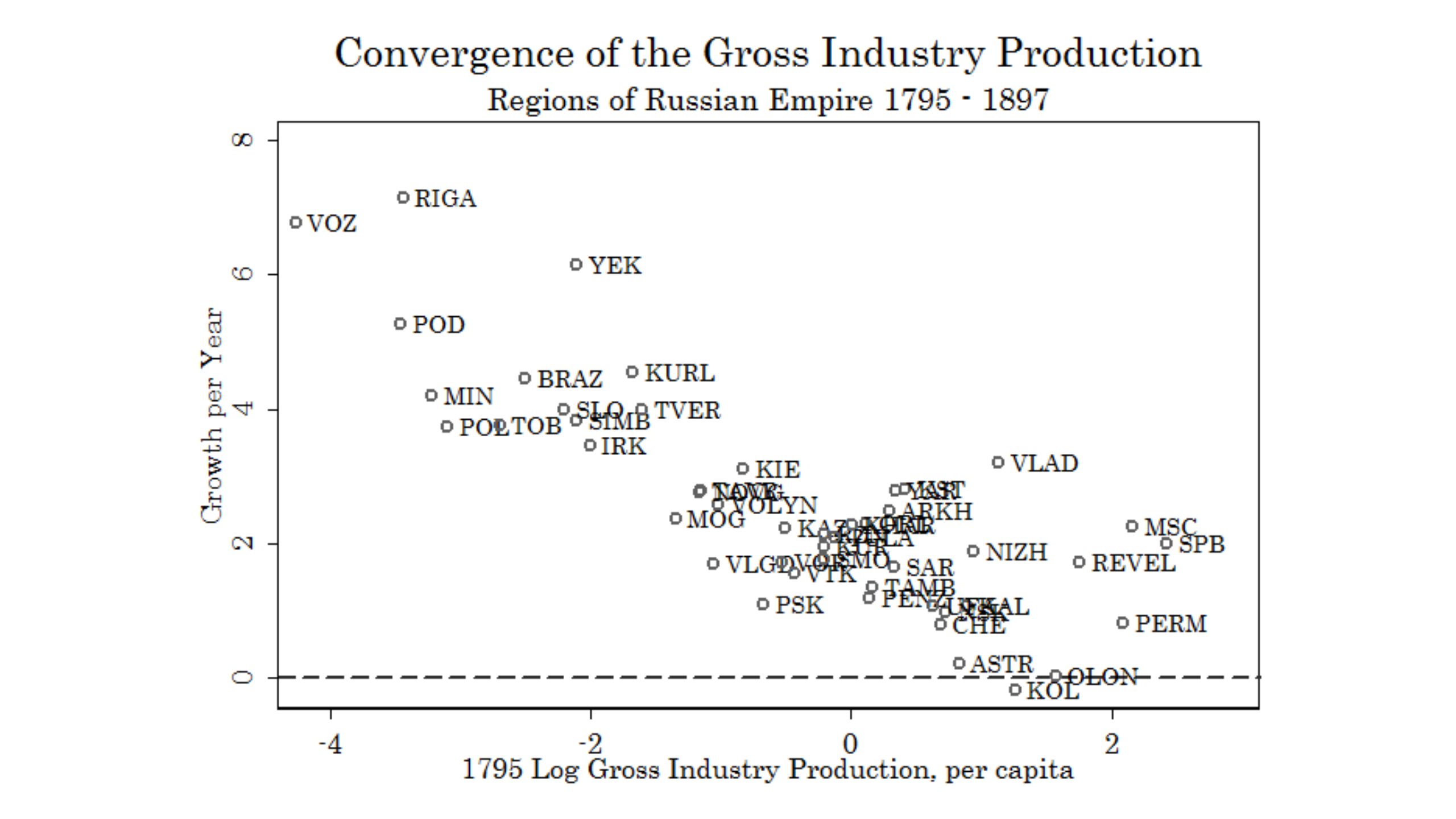
Empirical Investigation

Standard Approach
y(t=1) – Gross domestic product per capita in year 1
y(t=n) – Gross domestic product per capita in year "n"
g – annual growth rate of GDP per capita
i – Countries / Regions

Empirical Investigation

Standard Approach	My paper
y(t=1) – Gross domestic product per capita in year 1	*y(t=1795) – Gross industry production per capita in 1795*
y(t=n) – Gross domestic product per capita in year "n"	*y(t=1897) – Gross industry production per capita in 1897*
g – annual growth rate of GDP per capita	*g – annual growth rate*
i – Countries / Regions	*i – Countries / Regions*


Convergence of the Gross Industry Production
Regions of Russian Empire 1795 - 1897
Growth per Year
0
2
4
6
8
-4
-2
0
2
1795 Log Gross Industry Production, per capita


Convergence of the Gross Industry Production
Regions of Russian Empire 1795 - 1897
Growth per Year
8
6
4
2
0
RIGA
VOZ
YEK
POD
BRAZ
KURL
MIN
SLO
TVER
SIMB
IRK
KIE
VLAD
VOLYN
ARKH
MOG
MSC
SPB
NIZH
REVEL
SAR
TAMB
PSK
CHE
PERM
ASTR
KOL
-4
-2
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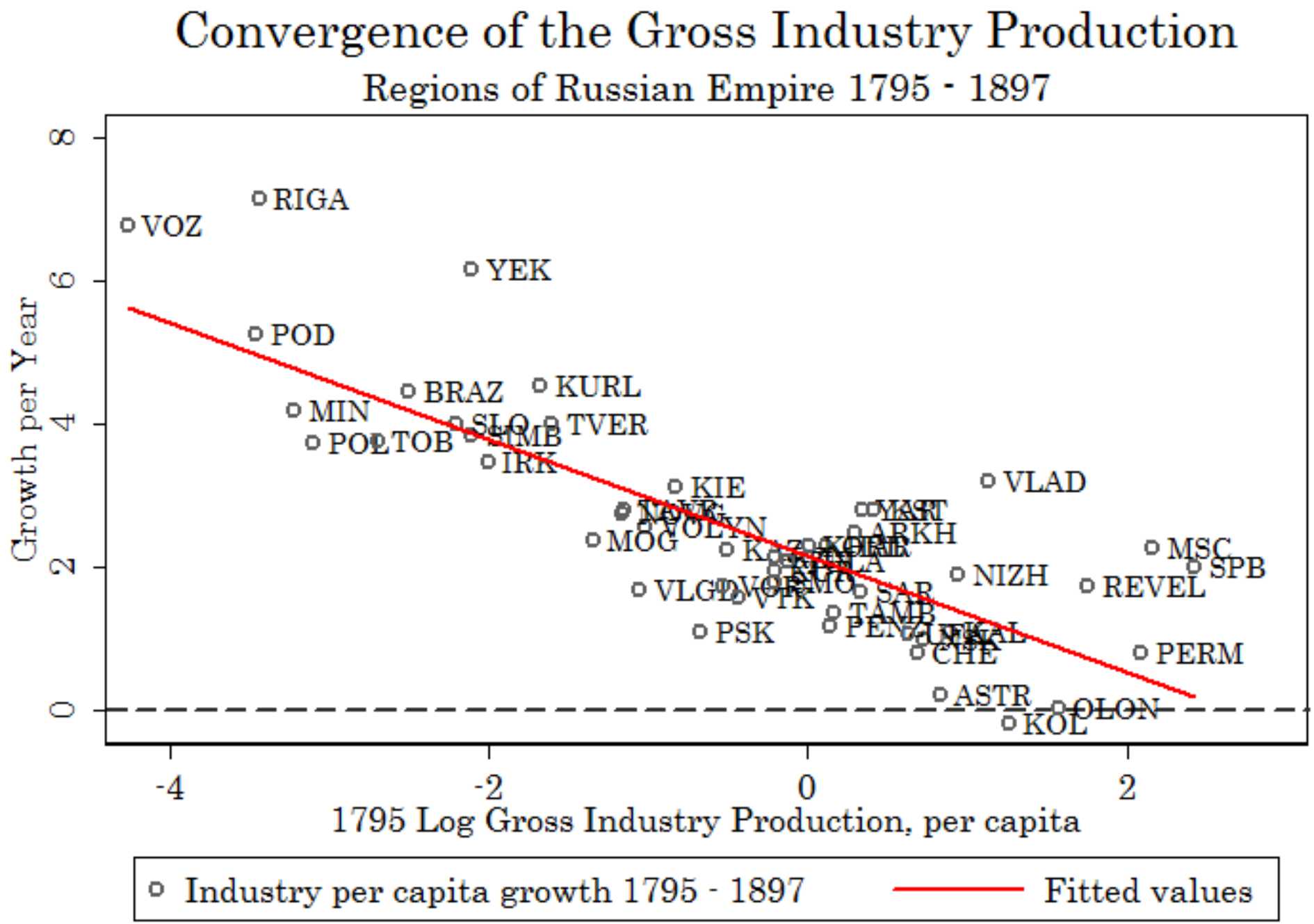
2
1795 Log Gross Industry Production, per capita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Regions of Russian Empire 1795 - 1897
Growth per Year
8
6
4
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0
RIGA
VOZ
YEK
POD
BRAZ
KURL
MIN
TVER
TOB
IRK
KIE
VLAD
MOG
MSC
SPB
NIZH
REVEL
VLG
PSK
PERM
ASTR
OLON
KOL
-4
-2
0
2
1795 Log Gross Industry Production, per capita
Industry per capita growth 1795 - 1897
Fitted values

Specifications of the Convergence Model. Dependent Variable: Real annual growth of the GIP per capita Estimated Half-Life

	Baseline	**Human Capital**		**Geography**	**Proxies for Trade**	**Compilations**
	(1)	(2)	(3)	(4)	(7)	(10)
Log Gross Industry Production per capita	-0.812***	-0.899***	-0.899***	-0.748***	-0.842***	-0.727***
	[-9.26]	[-8.39]	[-8.59]	[-9.23]	[-10.35]	[-6.67]
The Convergence Rate	1.64%	2.25%	2.25%	1.35%	1.81%	1.27%
Implied Half-Life, years	42	31	31	51	38	54
Observations	48	40	40	48	48	40
Adjusted R-squared	0.643	0.641	0.649	0.747	0.697	0.726

t statistics in brackets * p<0.1, ** p<0.05, *** p<0.01

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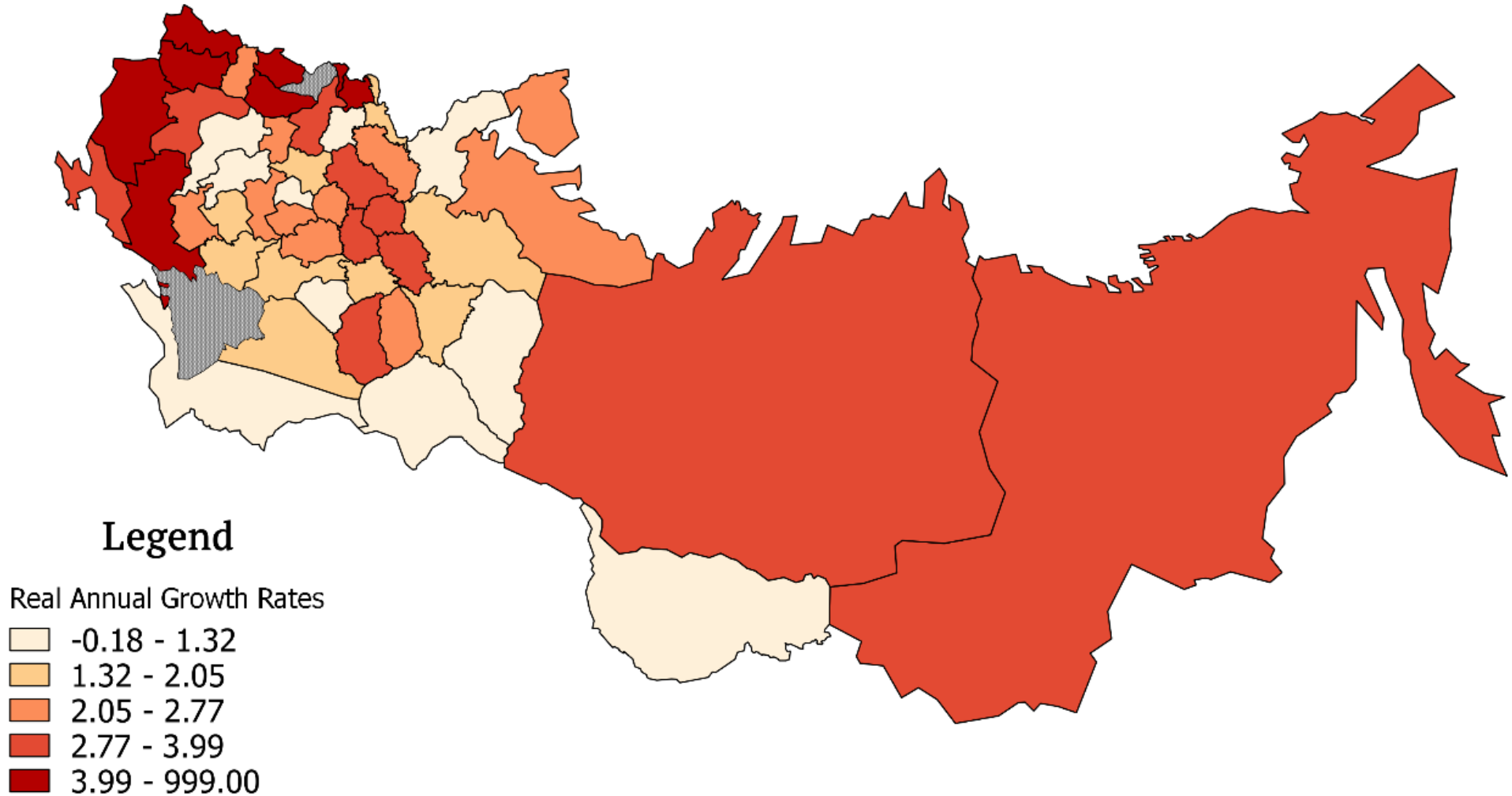
Map of the Russian Empire, In Borders of 1796

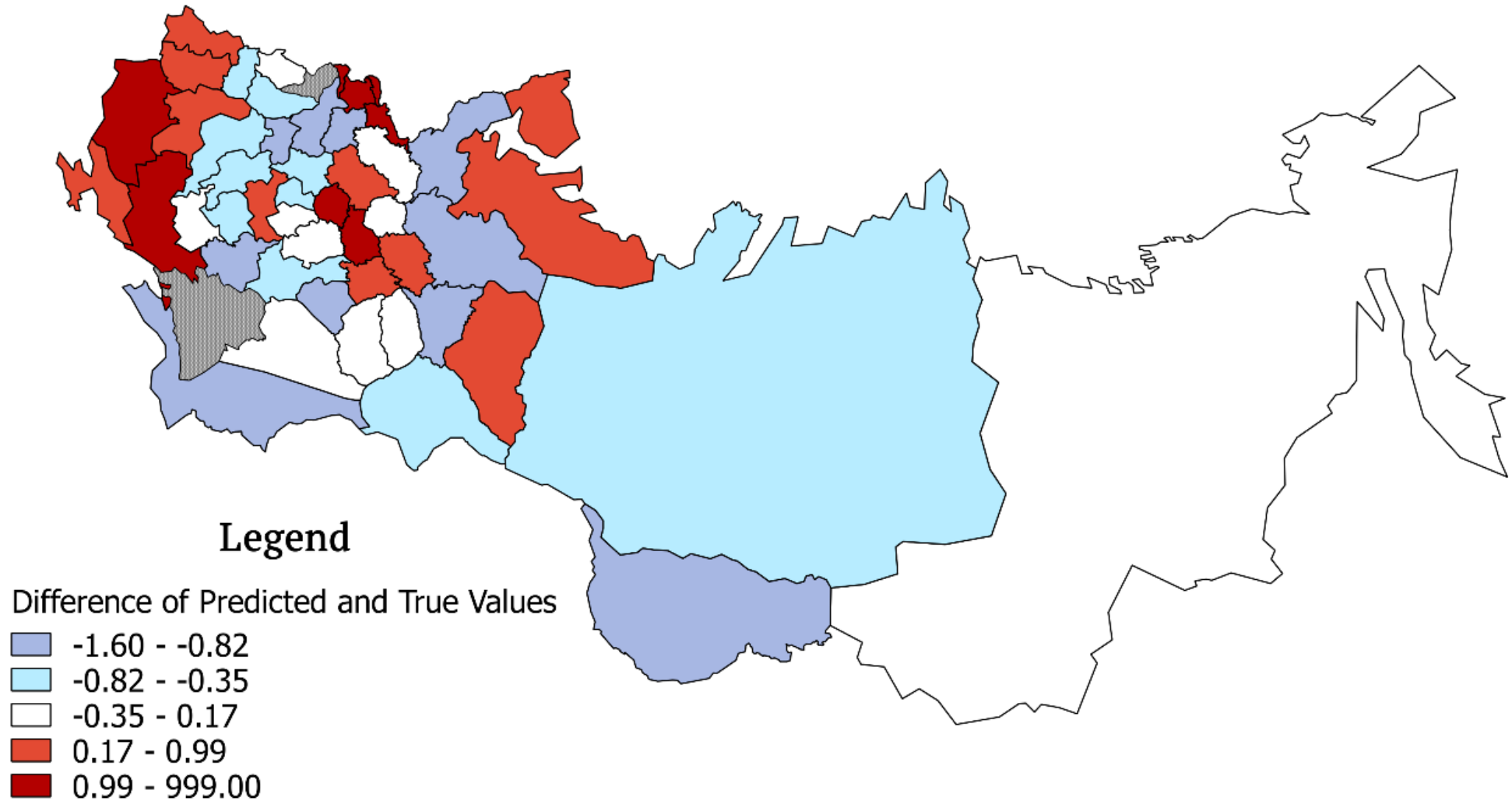
Note: the map represents the location and borders of the regions approximately; scale and size of the regions are likely to be inaccurate

Real Annual Per Capita Gross Industry Growth of the Regions of the Russian Empire (1795 - 1897), In Borders of 1796



Note: the map represents the location and borders of the regions approximately; scale and size of the regions are likely to be inaccurate

Baseline Model | Over- and Underestimation of the Real Annual Industry Growth Per Capita (1795 - 1897), In Borders of 1796



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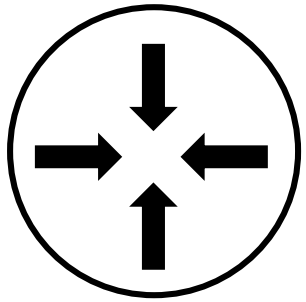
Conclusions

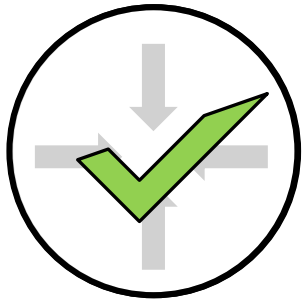


Convergence

Access to the Warm Seas

Education

Conclusions



Convergence

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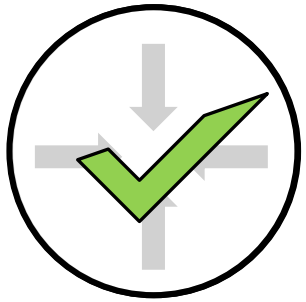

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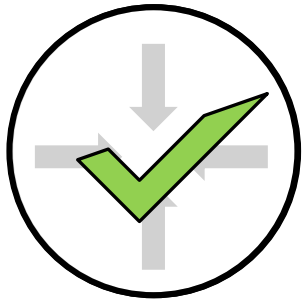

Convergence

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Limitations and Further Prospects

Statistical Issues	Contextual Issues
Price levels across regions Value Added vs Gross Industry Product Agriculture & Services vs Industry Population growth vs Labor force growth	Public investment: Malorossia (Ukraine) Effect of the institutions: emancipation of the serfs Protectionism Monetary policy (switch to bimetallism) Infrastructure: Railways Informal practices: Religious groups

Limitations and Further Prospects

Statistical Issues	**Contextual Issues**
Price levels across regions Value Added vs Gross Industry Product Agriculture & Services vs Industry Population growth vs Labor force growth	Public investment: Malorossia (Ukraine) Effect of the institutions: emancipation of the serfs Protectionism Monetary policy (switch to bimetallism) Infrastructure: railways, ports Informal practices: religion


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Annex

Research Question

(a) Did regions of the Russian Empire industrialize in the nineteenth century?

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(b) If so, did they industrialize according to the neoclassical growth model (convergence in production levels per capita)?

Empirical Investigation

$$\ln(y_{i,t}) - \ln(y_{i,t-\tau}) = \alpha + \beta * \ln(y_{i,t-\tau}) + \epsilon_i$$

Empirical Investigation

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Standard Approach

y – GDP per capita	
t-τ – Distance in years	
i – Countries / Regions	

Empirical Investigation

$$\ln(y_{i,t}) - \ln(y_{i,t-\tau}) = \alpha + \beta * \ln(y_{i,t-\tau}) + \epsilon_i$$

Standard Approach	My paper
y – GDP per capita	*y – Gross industry production per capita*
t-τ – Distance in years	*t-τ – 102 years (1795 – 1897)*
i – Countries / Regions	*i – Regions of the Russian Empire*

Data Sources

Regional Variables	Modern Source	Base
Gross industry output	Ristat	1797 | Government Commissions 1897 | Ministry Statistics + Handicraft Census
Population	Ristat, GCHLR	1795 | The 5th Revision 1897 | The 1st Census of the Russian Empire
Urbanization rate	Ristat, GCHLR	1795 | Storch (1795), The 5th Revision
Ethnicity (Jews, Germans)	GCHLR	1795 | The 5th Revision
Number of teachers and pupils	Ristat	1795 | Reports of the state commissions
Inflation rate	Mironov (2012)	Price of the consumer basket of the carpenters of St. Petersburg
Prices for manufacturing goods	-	Code of the good's prices (1900, 1901); Kabuzan (1994)
Changes in borders	-	Den (1902), Atlas (1796), Atlas (1808), Maps (1821, 1875)
Geolocation of the cities	Google Maps	-

Summary Stats

Variable	Obs	Mean	Std. Dev.	Min	Max
1795 | Population in Region	48	728,033	274,117	62,906	1,127,496
1897 | Population in Region	48	1,952,697	988,547	311,144	4,995,617
1795 | Gross Industry Production in a Region	48	1,034,873	1,608,484	10,579	8,435,317
1897 | Real Gross Industry Production in a Region	48	28,700,000	49,500,000	1,757,816	226,000,000
1795 | Gross Industry Production per capita, roubles	48	1.62	2.40	0.01	11.33
1897 | Real Gross Industry Production per capita, roubles	48	14.32	20.39	1.54	83.65
Annual Growth Rate, Real Gross Industry Production per capita	48	2.58	1.62	- 0.18	7.14

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1897 | Population in Region	48	1,952,697	988,547	311,144	4,995,617
1795 | Gross Industry Production in a Region	48	1,034,873	1,608,484	10,579	8,435,317
1897 | Real Gross Industry Production in a Region	48	28,700,000	49,500,000	1,757,816	226,000,000
1795 | Gross Industry Production per capita, roubles	48	1.62	2.40	0.01	11.33
1897 | Real Gross Industry Production per capita, roubles	48	14.32	20.39	1.54	83.65
Annual Growth Rate, Real Gross Industry Production per capita	48	2.58	1.62	- 0.18	7.14

Summary Stats

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Specifications of the Convergence Model. Dependent Variable: Real annual growth of the GIP per capita
Selected Covariates and Models

	Baseline	**Human Capital**		**Geography**	**Proxies for Trade**	**Compilation**
	(1)	(2)	(3)	(4)	(7)	(10)
Log GIP per capita	-0.812***	-0.899***	-0.899***	-0.748***	-0.842***	-0.727***
	[-9.26]	[-8.39]	[-8.59]	[-9.23]	[-10.35]	[-6.67]
Pupils per capita		138.1**				
		[2.12]				
Teachers per capita			3515.9**			459.7
			[2.35]			[0.18]
Border with the Black Sea				1.367**		1.456**
				[2.64]		[2.44]
Border with the Baltic Sea				1.683***		1.735**
				[3.91]		[2.44]
Germans per capita					674.9***	92.58
					[3.04]	[0.21]
Constant	2.160***	1.927***	1.942***	1.994***	2.019***	1.988***
	[14.70]	[10.90]	[11.55]	[14.31]	[14.10]	[7.02]
Observations	48	40	40	48	48	40
Adj. R-squared	0.643	0.641	0.649	0.747	0.697	0.726

t stat. in brackets * p<0.1, ** p<0.05, *** p<0.01

Specifications of the Convergence Model. Dependent Variable: Real annual growth of the GIP per capita Selected Covariates and Models

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Specifications of the Convergence Model. Dependent Variable: Real annual growth of the GIP per capita
Selected Covariates and Models

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Specifications of the Convergence Model. Dependent Variable: Real annual growth of the GIP per capita
Selected Covariates and Models

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	(1)	(2)	(3)	(4)	(7)	(10)
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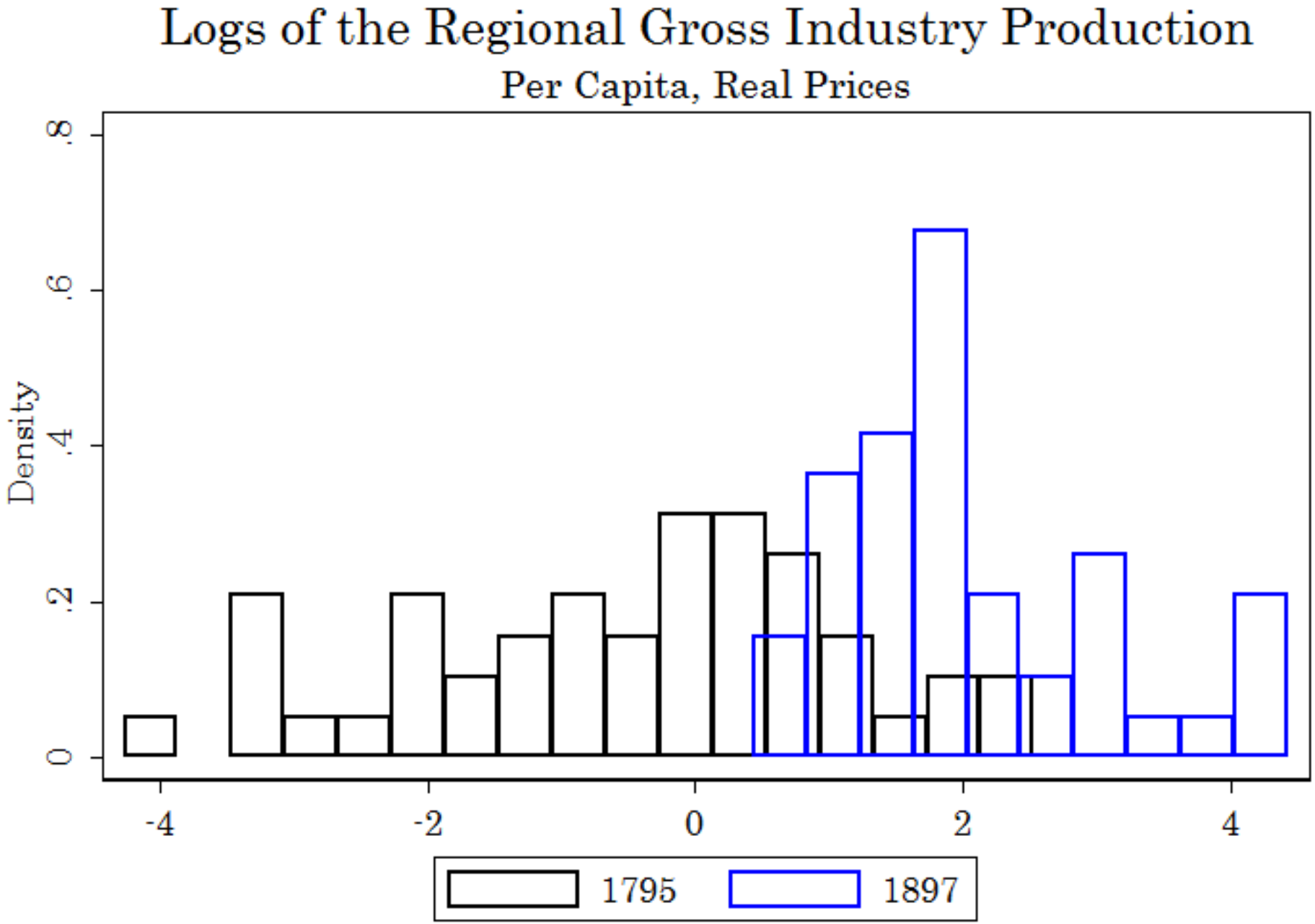
Logs of the Regional Gross Industry Production
Per Capita, Real Prices
Density
0
.2
.4
.6
.8
-4
-2
0
2
4
1795
1897

Specifications of the Convergence Model. Dependent Variable: Real annual growth of the GIP per capita Estimated Half-Life

	Baseline	**Human Capital**		**Geography**	**Proxies for Trade**	**Compilations**
	(1)	(2)	(3)	(4)	(7)	(10)
Log Gross Industry Production per capita	-0.812***	-0.899***	-0.899***	-0.748***	-0.842***	-0.727***
	[-9.26]	[-8.39]	[-8.59]	[-9.23]	[-10.35]	[-6.67]
The Convergence Rate	1.64%	2.25%	2.25%	1.35%	1.81%	1.27%
Implied Half-Life, years	42	31	31	51	38	54
Observations	48	40	40	48	48	40
Adjusted R-squared	0.643	0.641	0.649	0.747	0.697	0.726

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Convergence Model Augmented with the Spatial Effects

	Spatial Error Models				**Spatial Lag Models**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Gross Industry Production per capita	-0.794***	-0.769***	-0.826***	-0.782***	-0.798***	-0.765***	-0.827***	-0.773***
	[-9.15]	[-10.44]	[-10.60]	[-10.69]	[-9.56]	[-10.25]	[-10.77]	[-10.32]
Border with the Black Sea	No	Yes	No	Yes	No	Yes	No	Yes
Border with the Baltic Sea	No	Yes	No	Yes	No	Yes	No	Yes
German per capita	No	No	Yes	Yes	No	No	Yes	Yes
lambda - Spatial Error Coeff.	0.439	0.426	0.566	0.517				
	[0.99]	[0.98]	[1.53]	[1.33]				
rho - Spatial Lag Coeff.					0.532*	-0.111	0.507*	-0.00214
					[1.76]	[-0.29]	[1.73]	[-0.01]
Observations	48	48	48	48	48	48	48	48

t statistics in brackets * p<0.1, ** p<0.05, *** p<0.01

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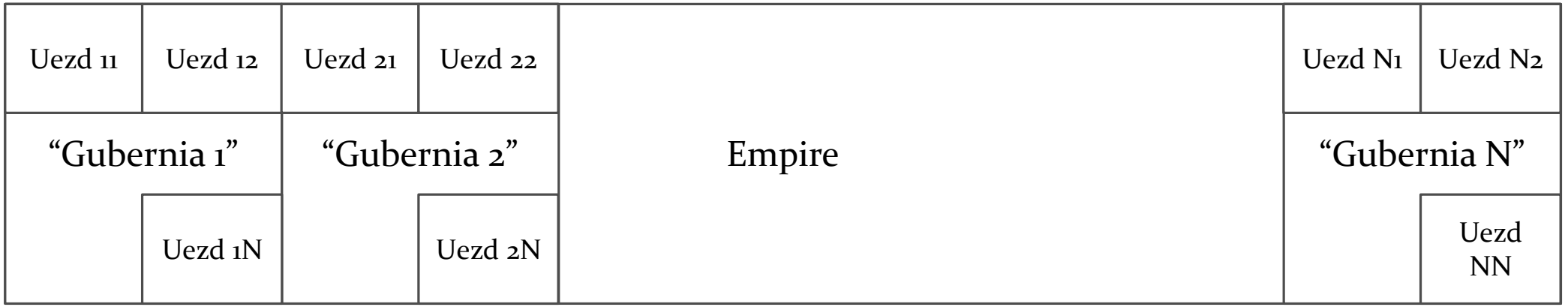
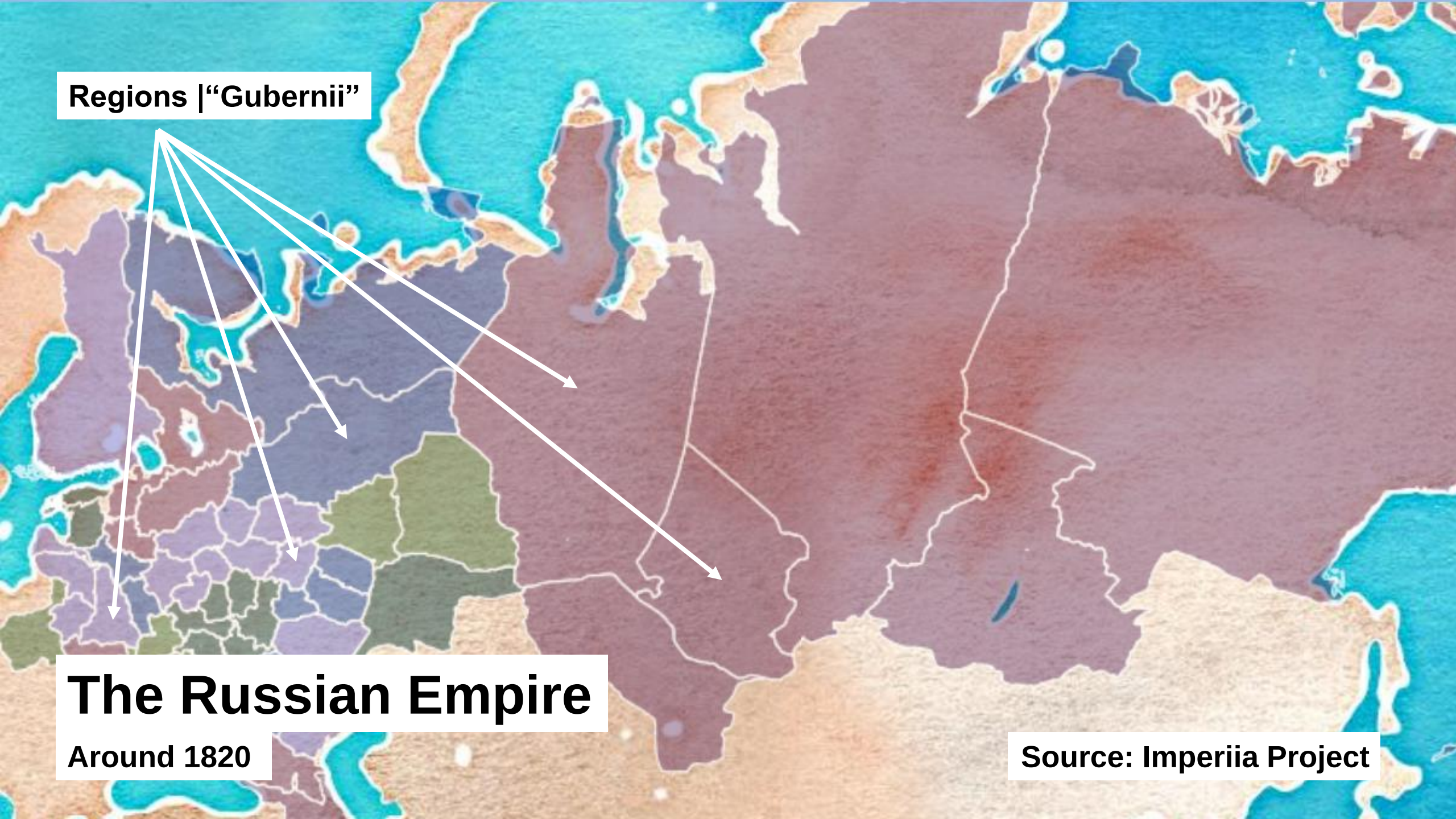
Data Adjustment

Besides inflation one has to correct the data according to the changes in regional borders.

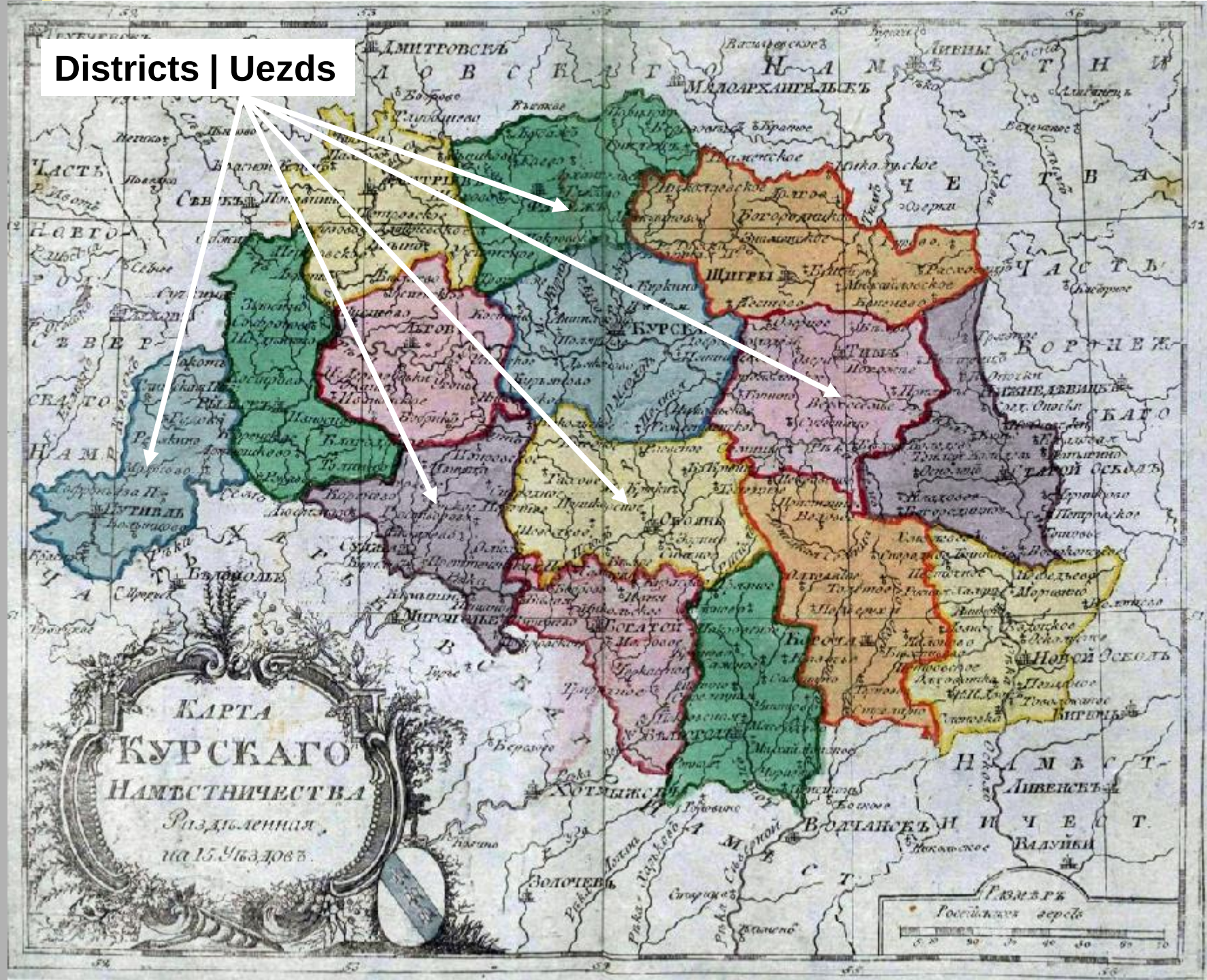
The number of regions in Russia Increased from 50 in 1797 to 89 in 1897. Main changes in the European part occurred from 1797 to 1808. Changes in other regions were mainly due to acquisition of the new

Hierarchy of the Regional Division: Empire -> Regions (Gubernii) -> Districts (Uezdy) -> Sub-districts (Volosty)




Regions |“Gubernii”
The Russian Empire
Around 1820
Source: Imperiia Project

The Kursk Region

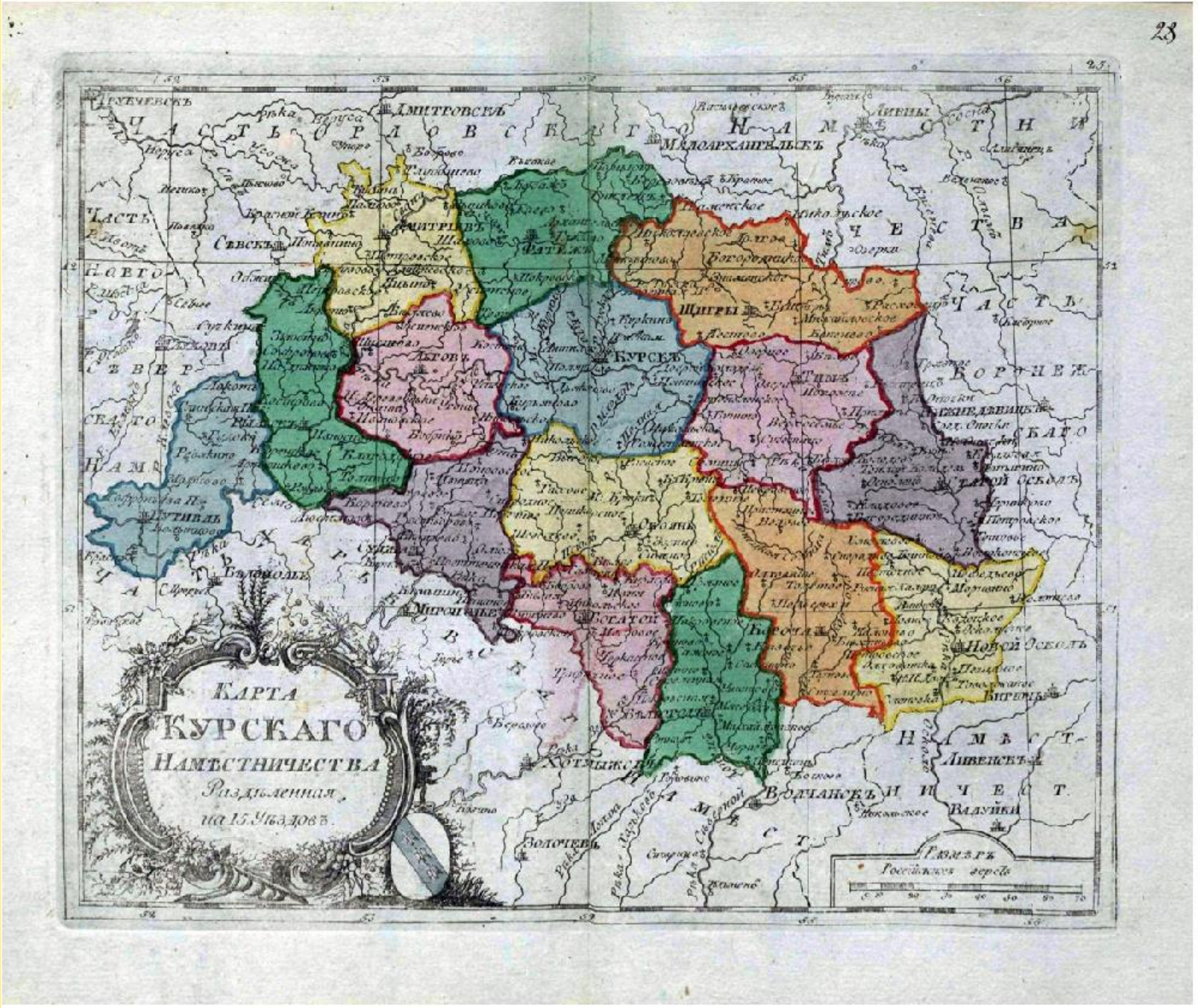


An Example of the Border Adjustment

Case: the Kursk Region

YEAR: 1796

District's division is in color.

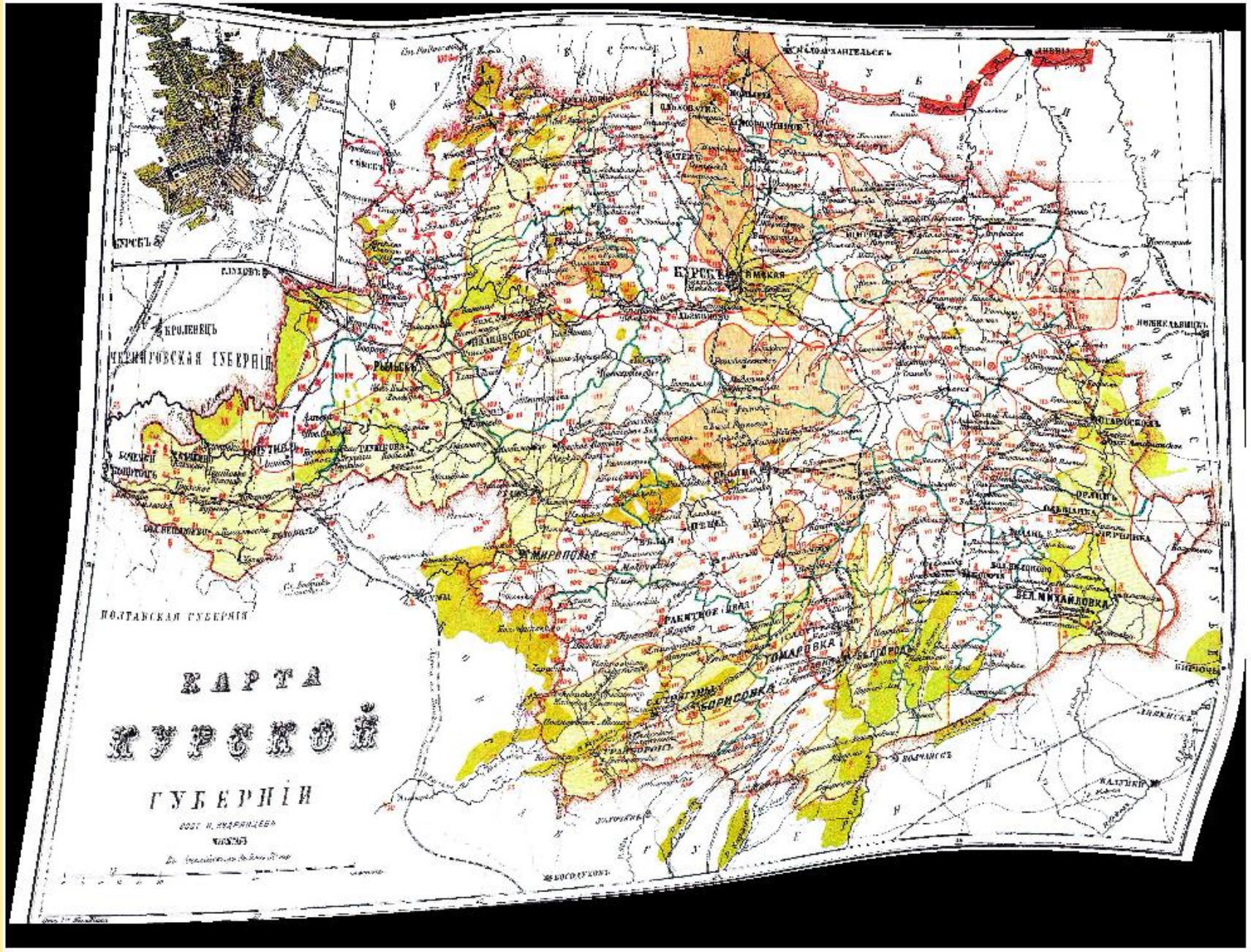


Case: the Kursk Region

YEAR: 1876

District's division is by the tiny green lines.

The image is squeezed since it was "pinned" to the point of the older map to provide comparability of the estimated squares.



A Direct Overlay

Opacity of the later map: 40%

The method required a lot of the handicraft work

From this macro-view, the differences are difficult to see. Let's go deeper.

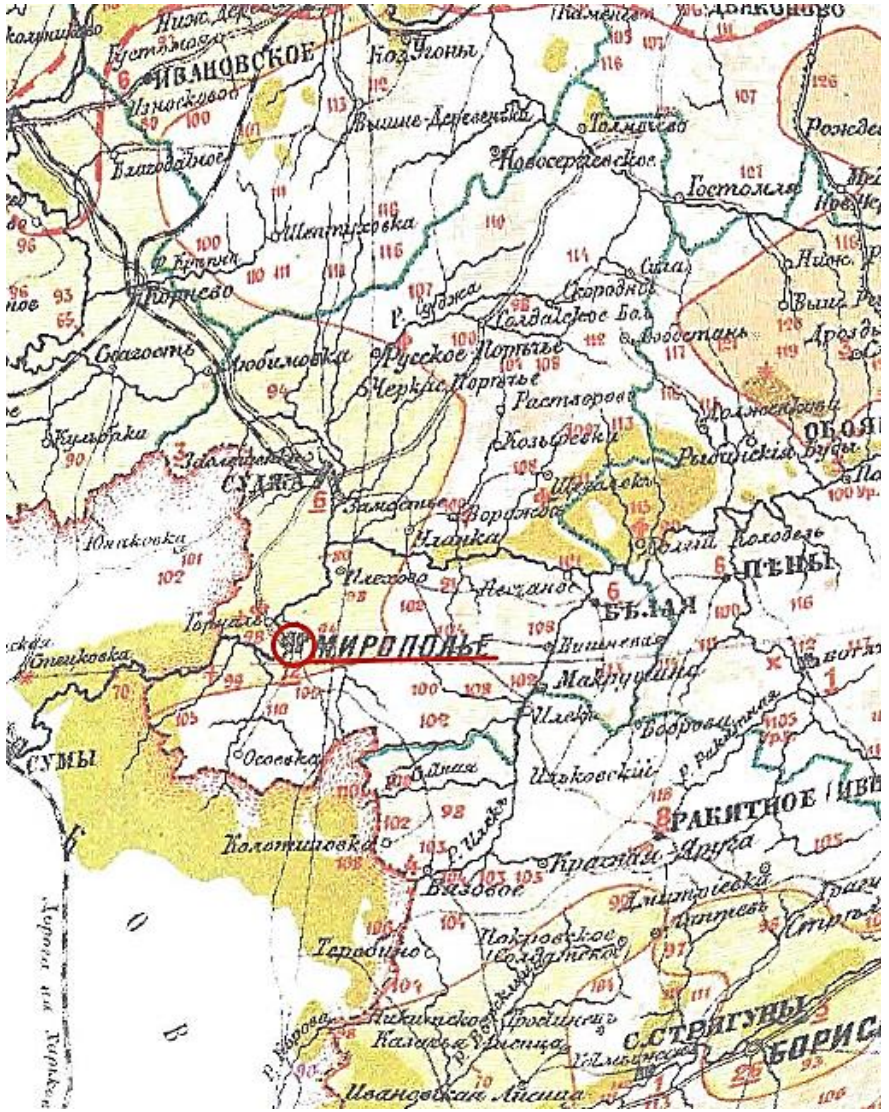
Microview | The Miropolje Case

The city “Miropolje” was not the part of the Kursk region in 1796.

Microview | The Miropolje Case

The city “Miropolje” was not the part of the Kursk region in 1796.

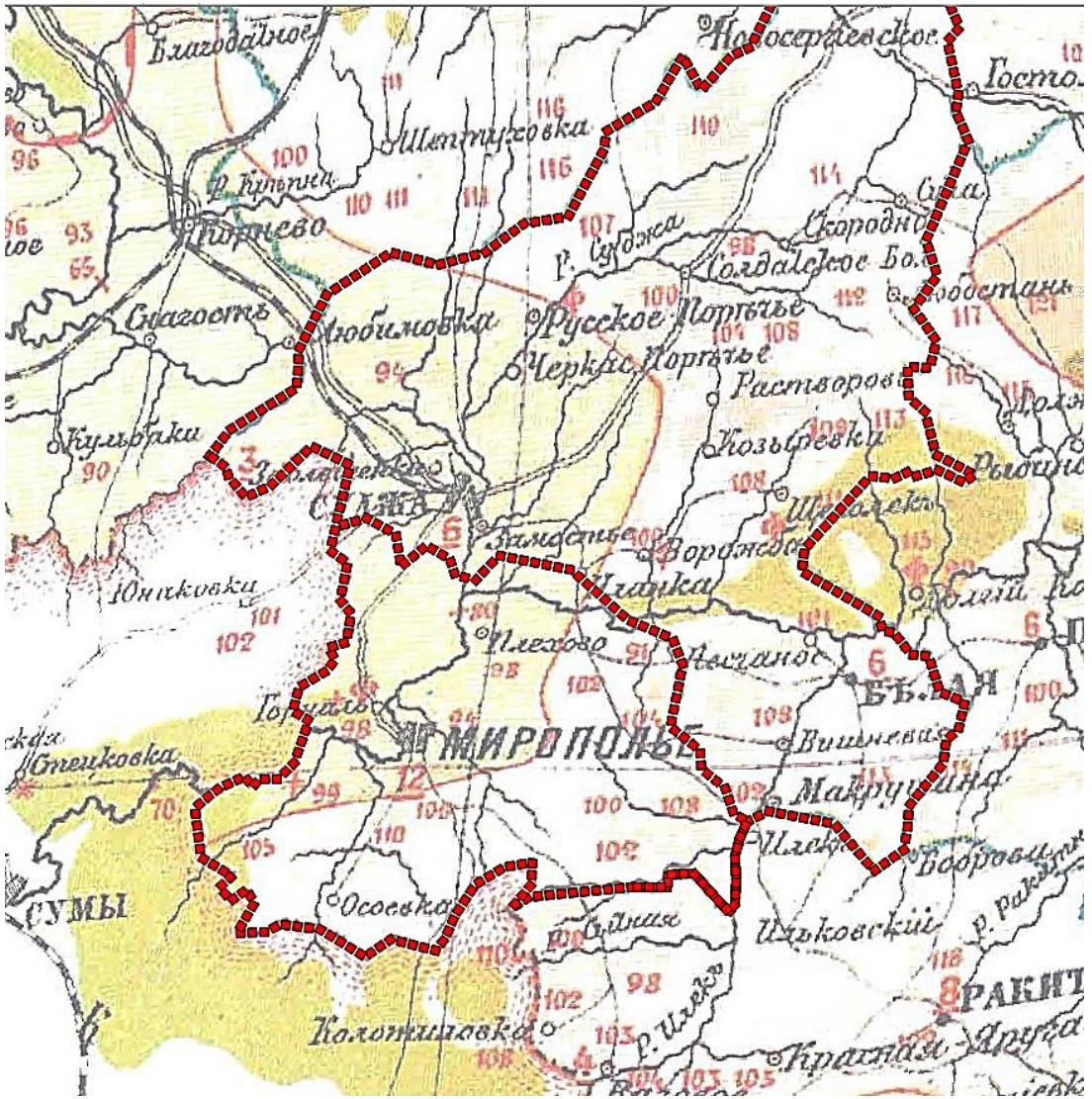
But it was assigned to the region in 1876 (it lies within the borders)



The Overlay View

The violett area is the square of the old (1796) district. We can see (more or less) where it ends and by how much the square of the new district extends.

Border of the District



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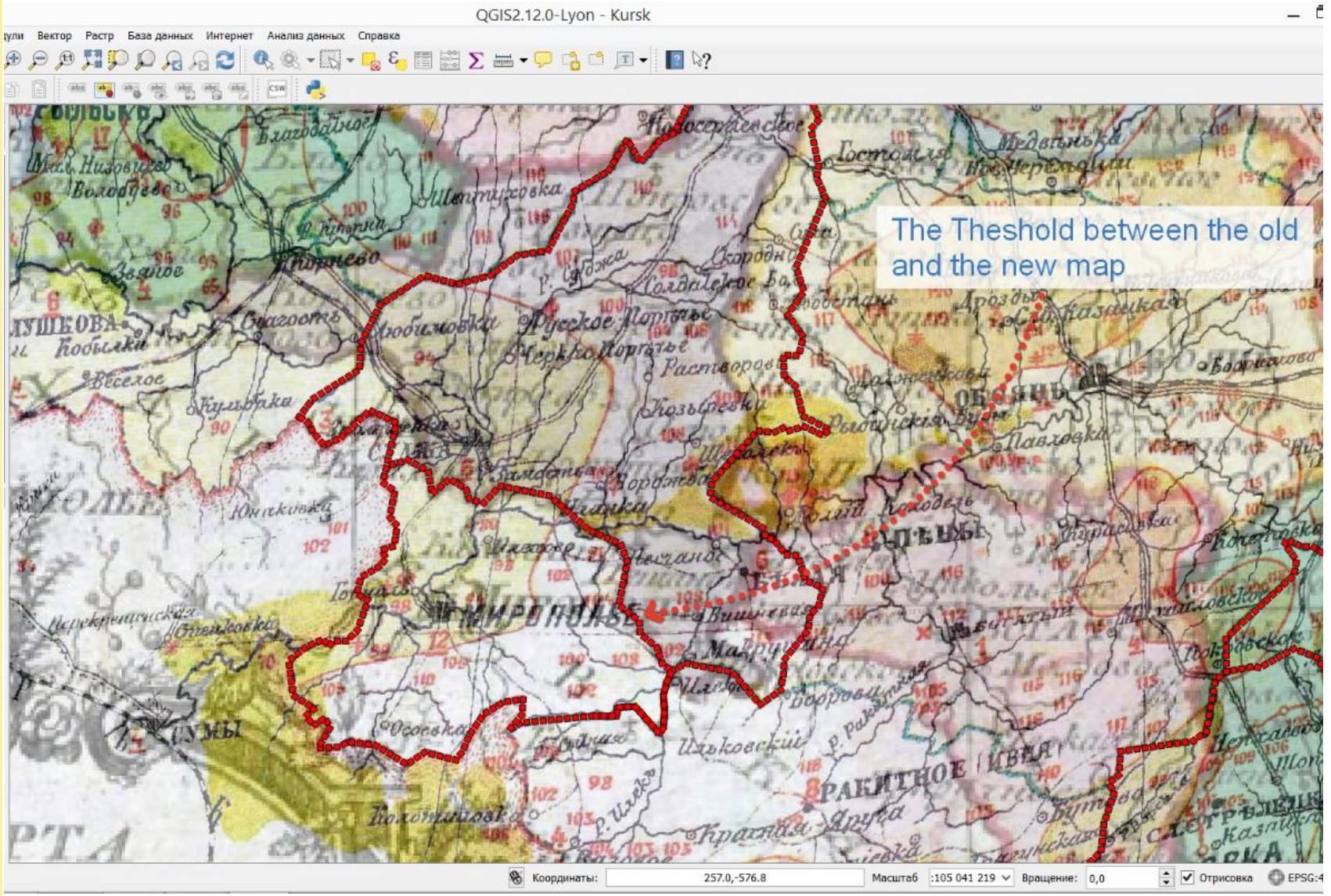

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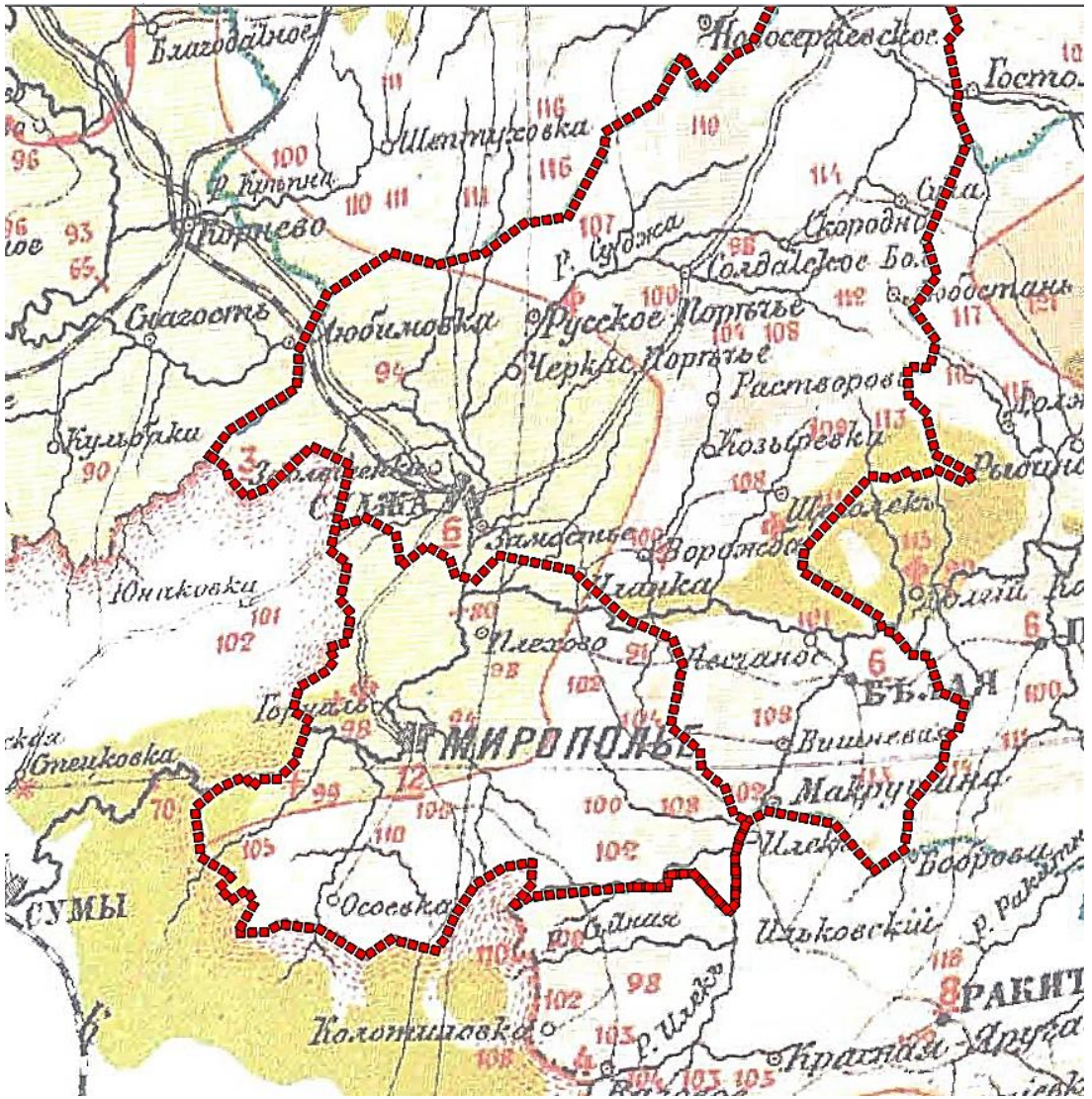
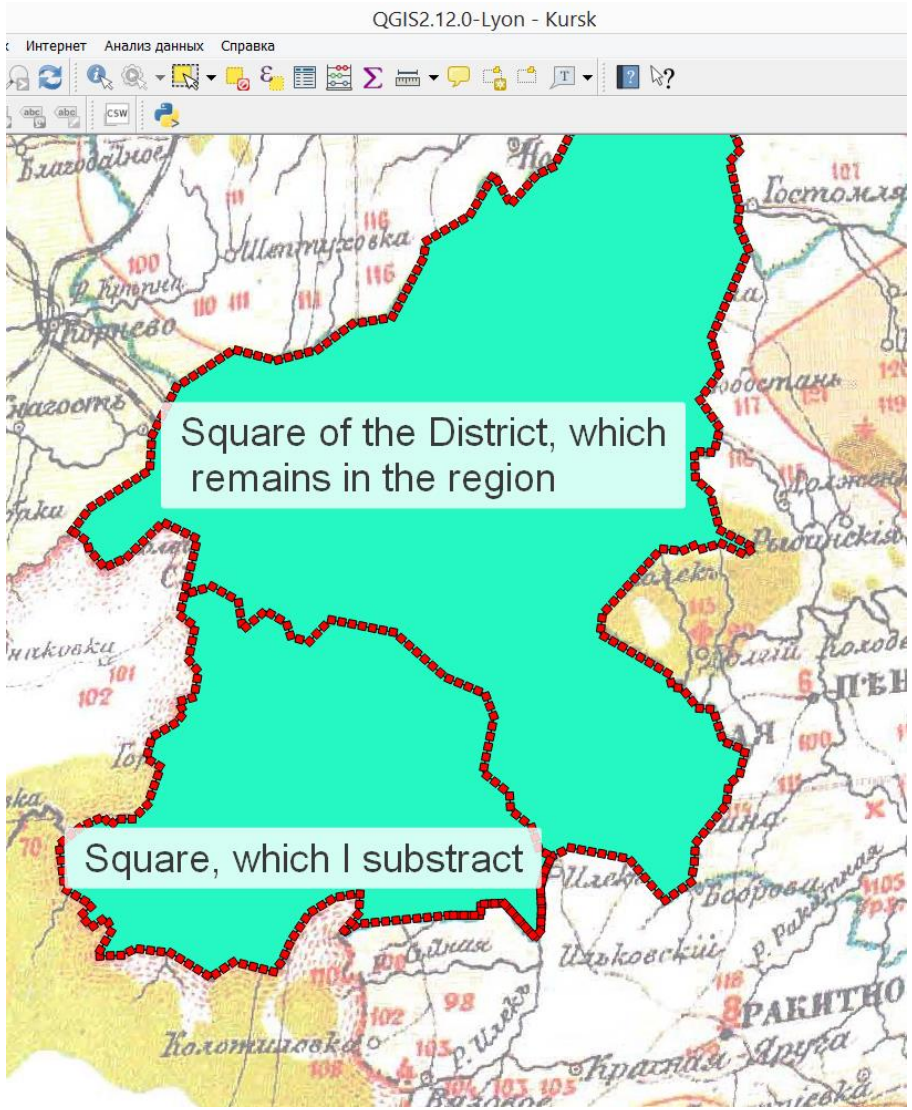
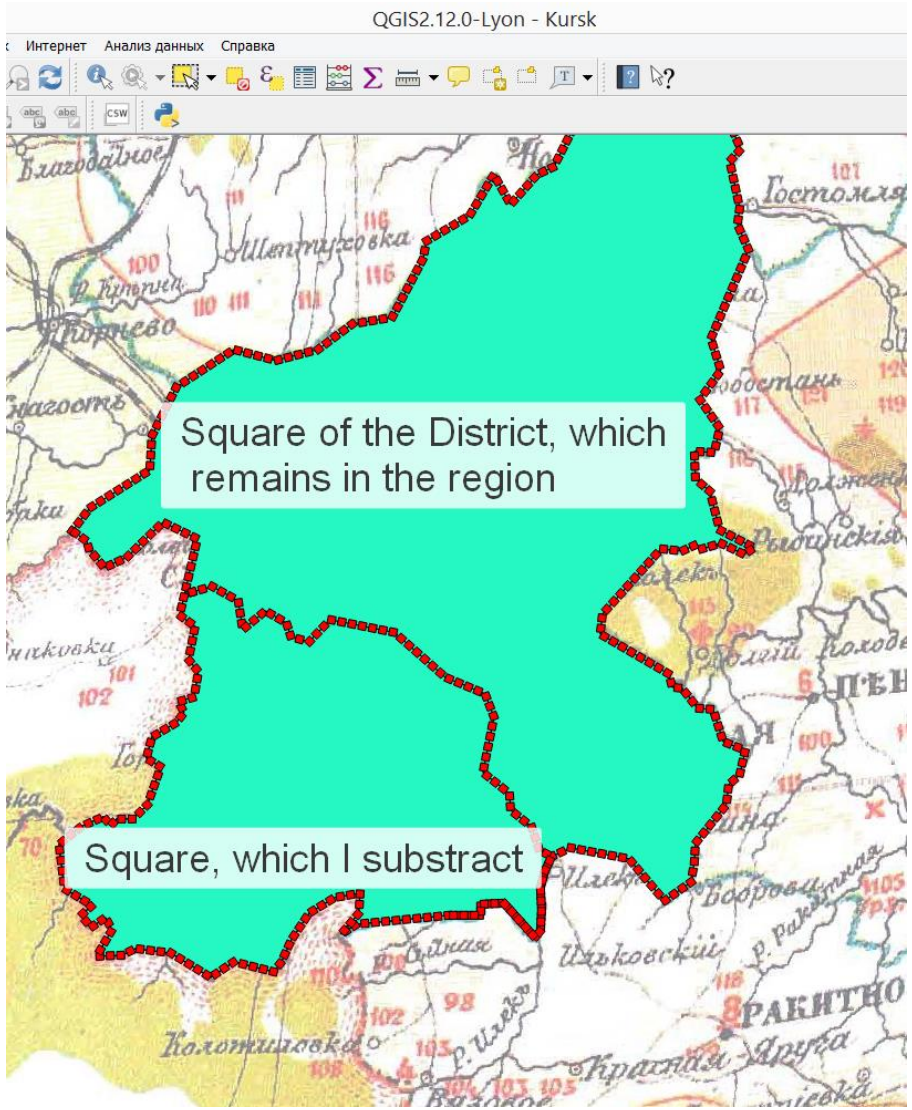
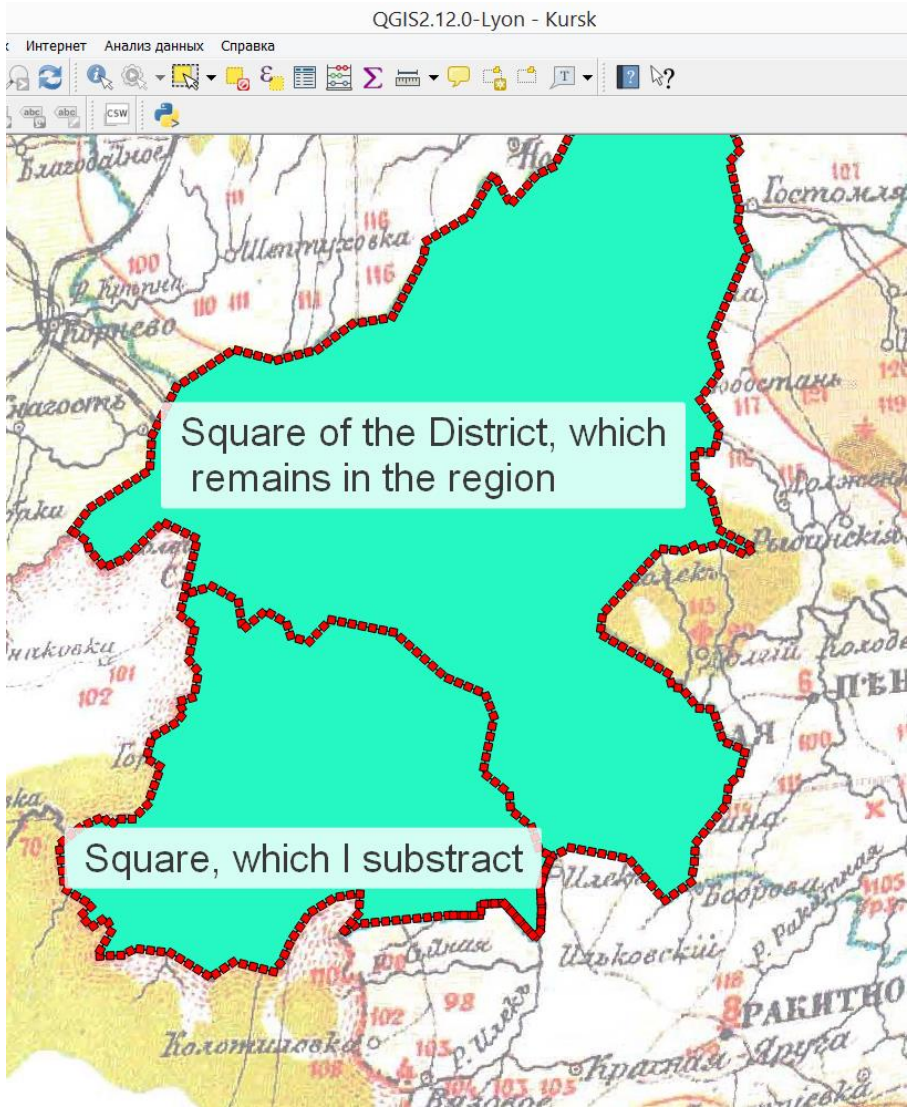


Squares of the District



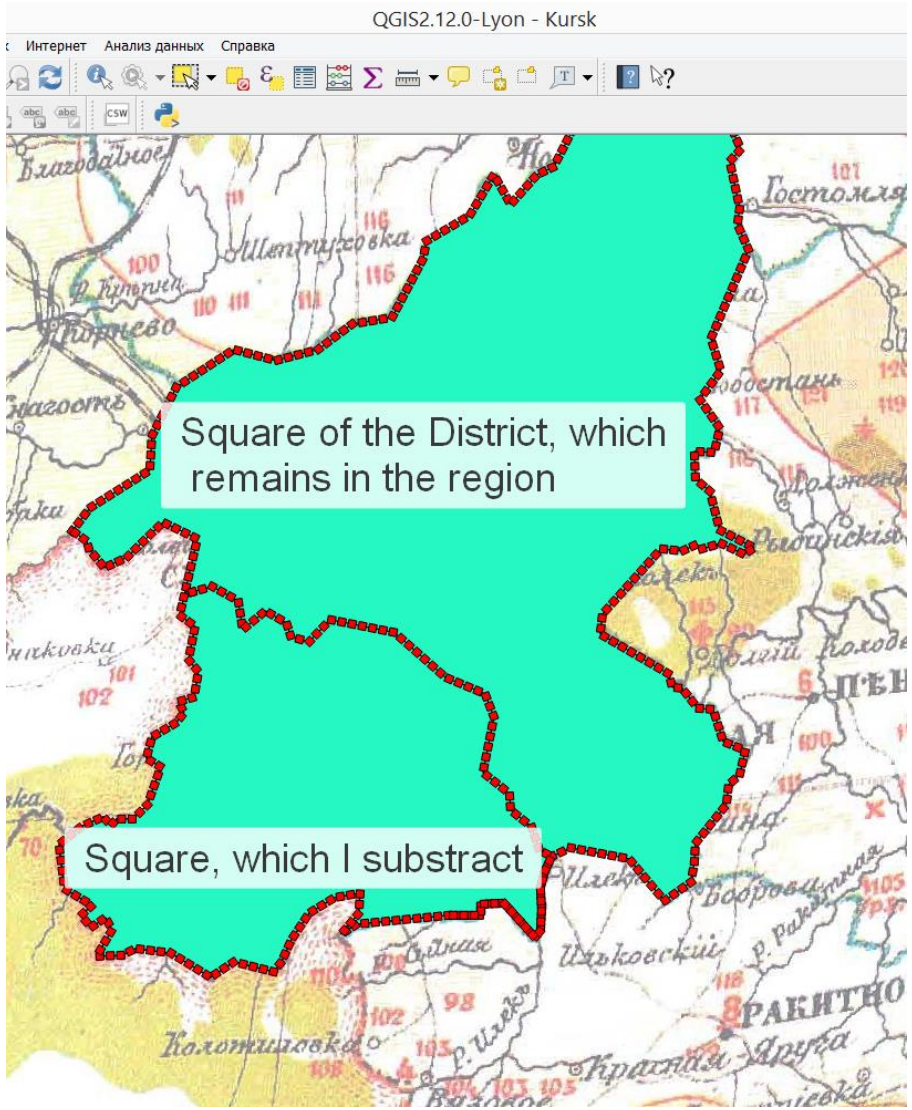


Total Square (St): 27935 Sq. Units



Total Square (St): 27935 Sq. Units

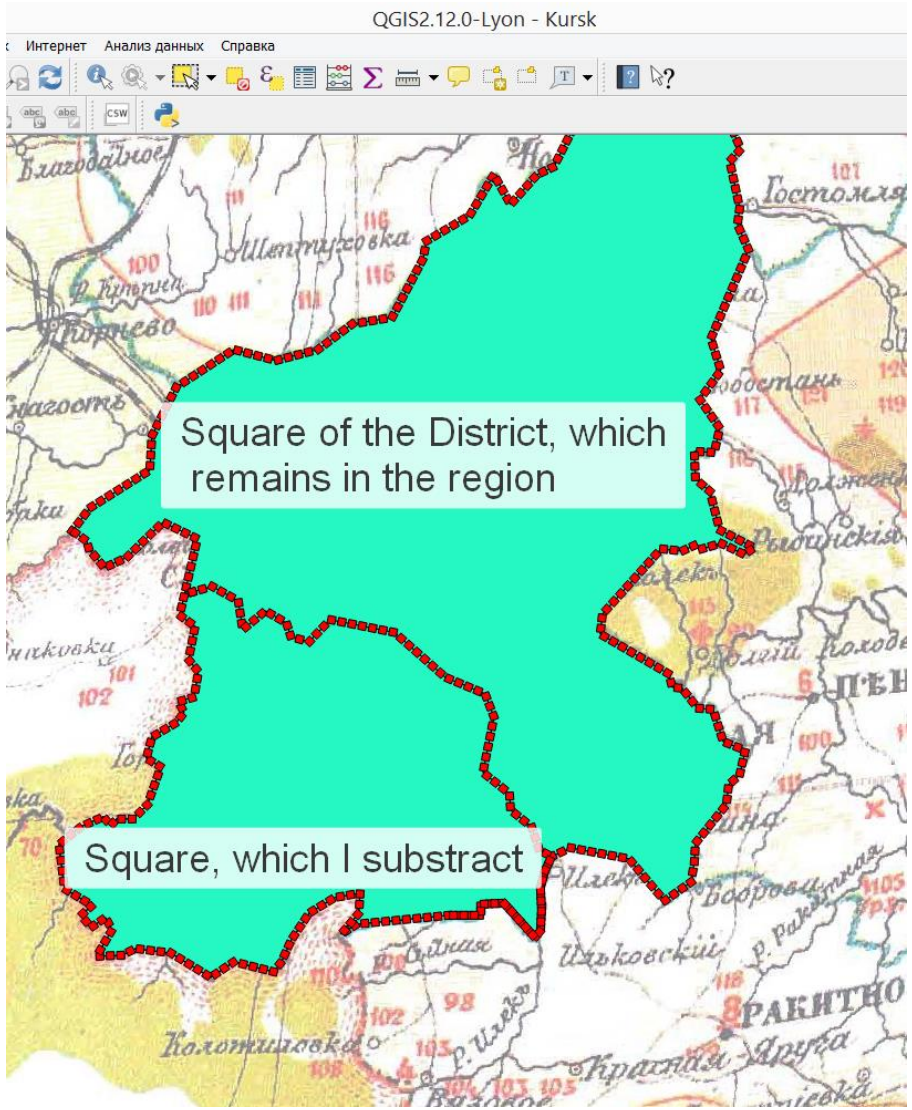
Square of the Substracted Part (Ss): 8389 Sq. Units



Total Square (St): 27935 Sq. Units

Square of the Substracted Part (Ss): 8389 Sq. Units

Ratio (Ss / St) = 30%



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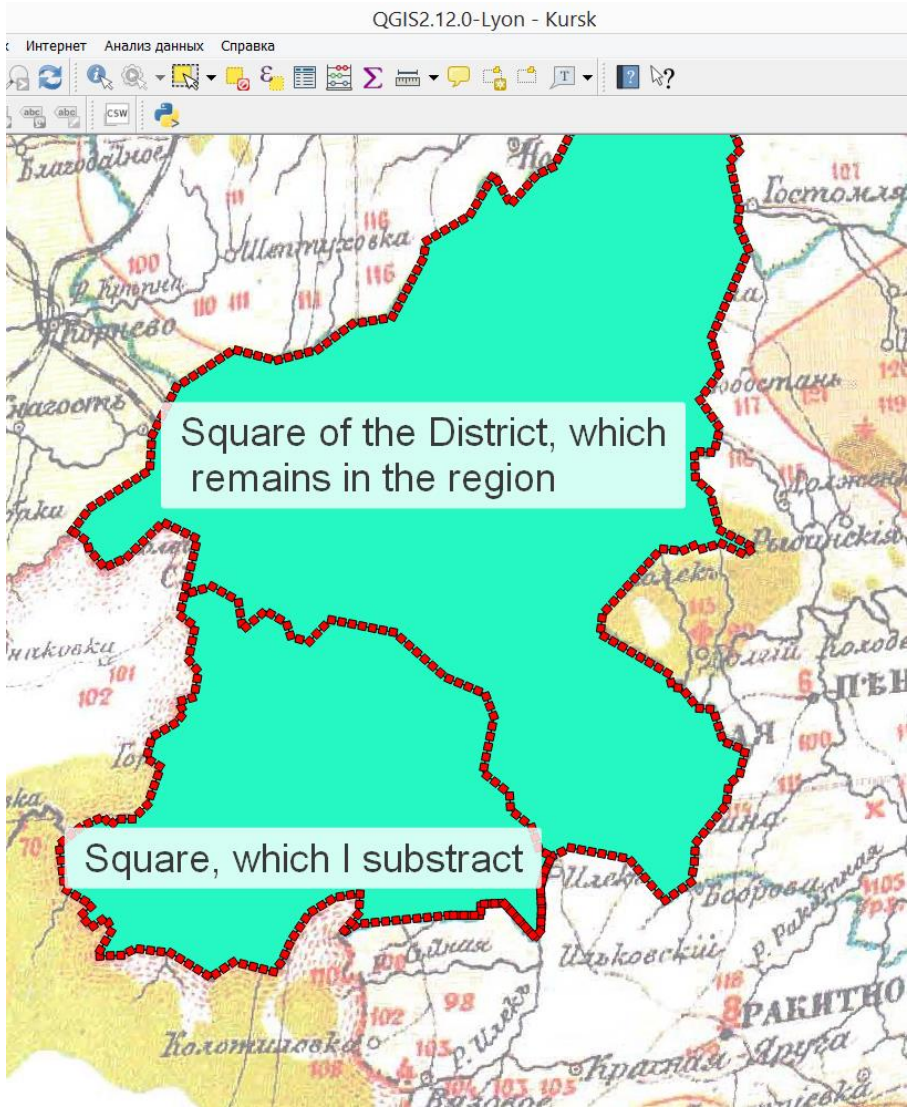
Ratio (Ss / St) = 30%

Share of the district's population in the regional population (1897) = 6.35%



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Square of the Substracted Part (Ss): 8389 Sq. Units

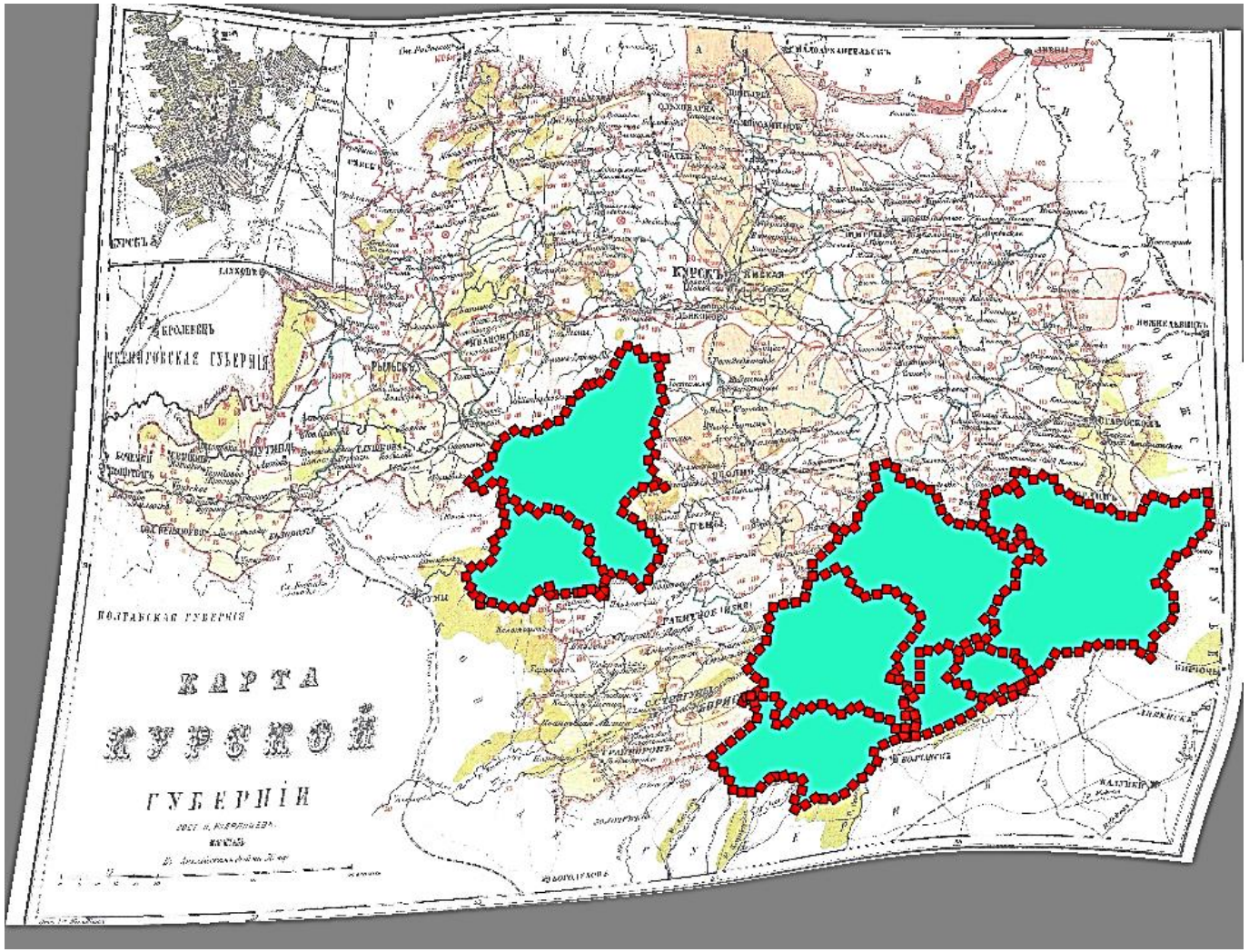
Ratio (Ss / St) = 30%

Share of the district's population in the regional population (1897) = 6.35%

Correction coefficient = 0.3 * 0.0635 = 0.0195 (1.95%)

The Complete Overview of Kursk

Every green area represent a specific district of the region that was partly of fully reassigned to it from the other region since 1797.



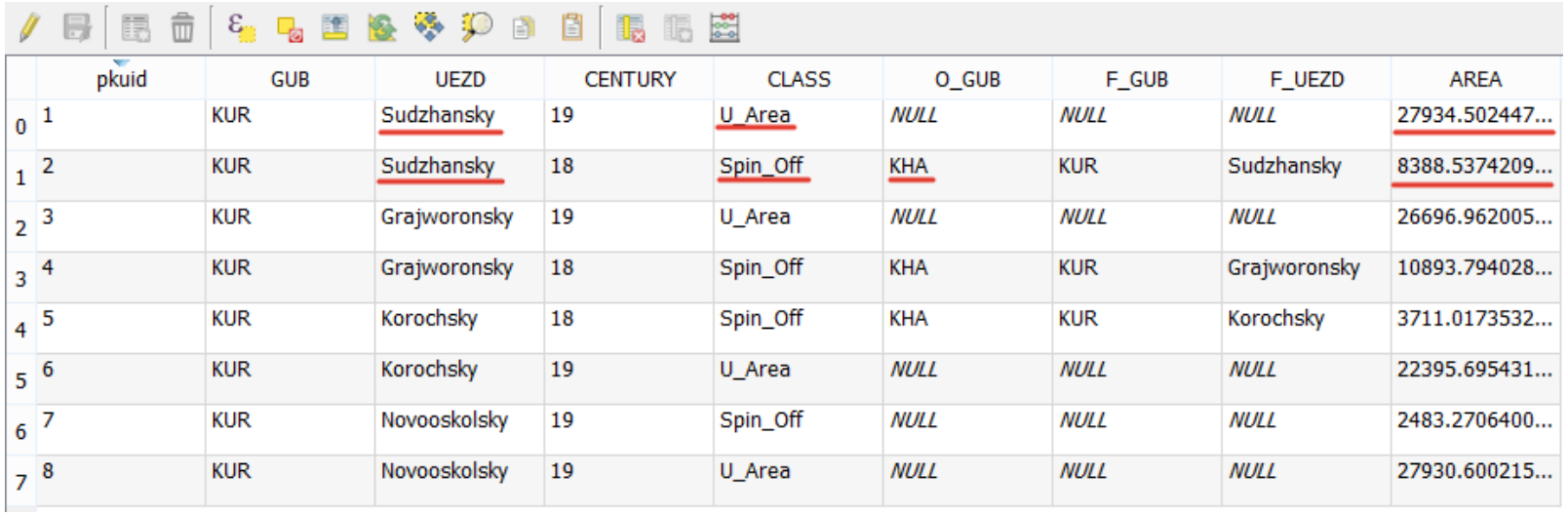
The Squares Table

Spin_Off / U_Area gives appr. 0.30

Therefore, I suppose that 30% of the industry output of the Sudzhansky district of the Kursk region should be assigned to the Kharkov region.

The Sudzhansky district accounted for 6.35% of the total population in Kursk region in 1897. I assume that the same ratio is true for the district's share in the industrial output in the region.

Therefore I subtract the multiple 0.3 * 0.0635 * (Ind. Output in Kursk) from the Kursk region and add it to Kharkov

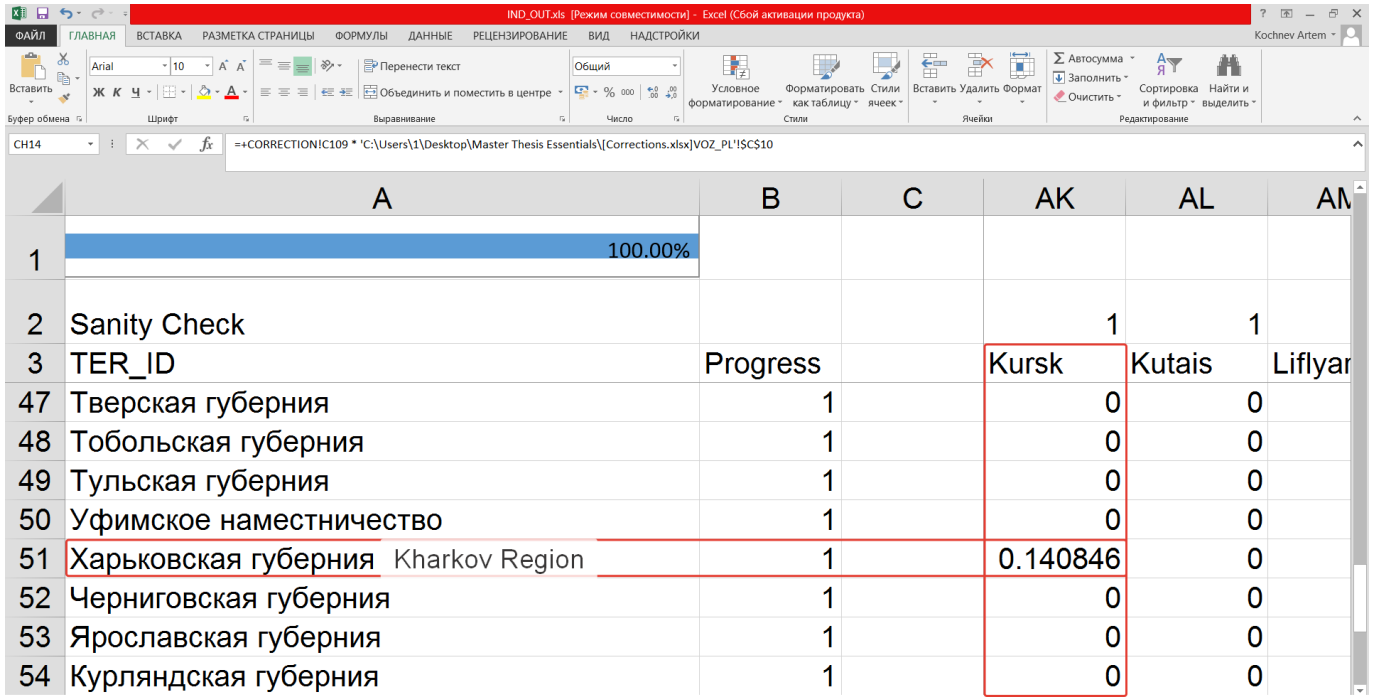


	pkuid	GUB	UEZD	CENTURY	CLASS	O_GUB	F_GUB	F_UEZD	AREA
0	1	KUR	Sudzhansky	19	U_Area	*NULL*	*NULL*	*NULL*	27934.502447...
1	2	KUR	Sudzhansky	18	Spin_Off	KHA	KUR	Sudzhansky	8388.5374209...
2	3	KUR	Grajworonsky	19	U_Area	*NULL*	*NULL*	*NULL*	26696.962005...
3	4	KUR	Grajworonsky	18	Spin_Off	KHA	KUR	Grajworonsky	10893.794028...
4	5	KUR	Korochsky	18	Spin_Off	KHA	KUR	Korochsky	3711.0173532...
5	6	KUR	Korochsky	19	U_Area	*NULL*	*NULL*	*NULL*	22395.695431...
6	7	KUR	Novooskolsky	19	Spin_Off	*NULL*	*NULL*	*NULL*	2483.2706400...
7	8	KUR	Novooskolsky	19	U_Area	*NULL*	*NULL*	*NULL*	27930.600215...

The Conversion Table

The same procedure is applied for the districts that were reassigned to other regions during the 19th century.

In the case of Kursk, 14.1% was initially governed by the Kharkov authorities in 1797. Therefore, we reassign 14.1% of the population and industry output from Kursk to Kharkov region.



	A	B	C	AK	AL	AM
1	100.00%					
2	Sanity Check			1	1	
3	TER_ID	Progress		Kursk	Kutais	Liflyar
47	Тверская губерния	1		0	0	
48	Тобольская губерния	1		0	0	
49	Тульская губерния	1		0	0	
50	Уфимское наместничество	1		0	0	
51	Харьковская губерния	1		0.140846	0	
52	Черниговская губерния	1		0	0	
53	Ярославская губерния	1		0	0	
54	Курляндская губерния	1		0	0	

100.00%

Sanity Check		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TER_ID	Progress	Akmola	Amur	Arkhangelsk	Astrakhan	Baku	Bessarabiya	Warsaw	Vilno	Vitebsk	Vladimir	Don	Vologda	Volyn	Voronezh	Vyatka	Grodno	Dagestan	Ekaterinoslav	Elisavetopol	Enisej	Zabajkal	Zakaspij
Архангельская губерния	1	0	0	0.8953707	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Брацлавская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Виленская губерния	1	0	0	0	0	0	0	0	0.73798	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Владимирская губерния	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Вознесенская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Вологодская губерния	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Волынская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0.75034	0	0	0	0	0	0	0	0	0
Воронежская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9236	0	0	0	0	0	0	0	0
Выборгская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Вятская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Екатеринославское наместничество	1	0	0	0	0	0	0	0	0	0	0	0.14324	0	0	0	0	0	0	1	0	0	0	0
Земля войска Донского	1	0	0	0	0	0	0	0	0	0	0	0.82001	0	0	0	0	0	0	0	0	0	0	0
Иркутская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Кавказская область Астраханской губернии	1	0	0	0	0.80076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Казанская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Калужская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Киевская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Колыванская губерния	1	0.008805	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.64391	0	0
Костромская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Курская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Минская губерния	1	0	0	0	0	0	0	0	0.26202	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Могилевская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Московская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Нижегородская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Новгородская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Новгородско-Северская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Олонецкая губерния	1	0	0	0.1046293	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Орловская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Пензенская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Пермская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Подольская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0.23461	0	0	0	0	0	0	0	0	0
Полоцкая губерния	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Псковская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ревельская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Рижская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Рязанская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Санкт-Петербургская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Саратовская губерния	1	0	0	0	0.19924	0	0	0	0	0	0	0	0	0	0.0764	0	0	0	0	0	0	0	0
Симбирская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Слонимское наместничество	1	0	0	0	0	0	0	0	0	0	0	0	0	0.01505	0	0	0.87012	0	0	0	0	0	0
Смоленская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Таврическая область	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Тамбовская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Тверская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Тобольская губерния	1	0.05214	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.35609	0	0
Тульская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Уфимское наместничество	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Харьковская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Черниговская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ярославская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Курляндская губерния	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Приобретения		0.939054	1			1	1	1				0.03675					0.12988	1		1			1