

IZA/Higher School of Economics Workshop: Labor Market Adjustment in the Commonwealth of Independent States, Central Asia and China in the Wake of the Great Recession

Convergence among Russian Regions

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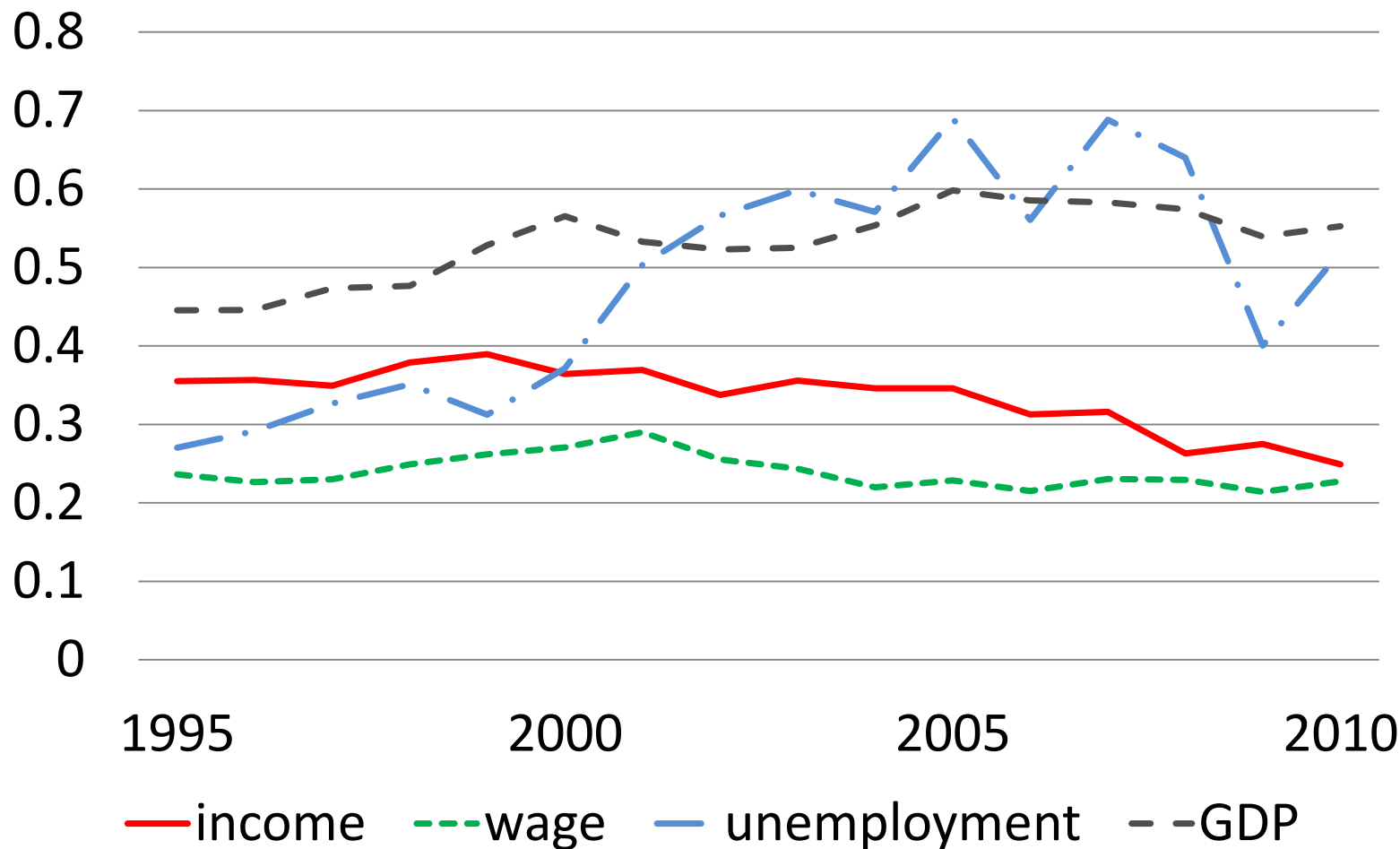


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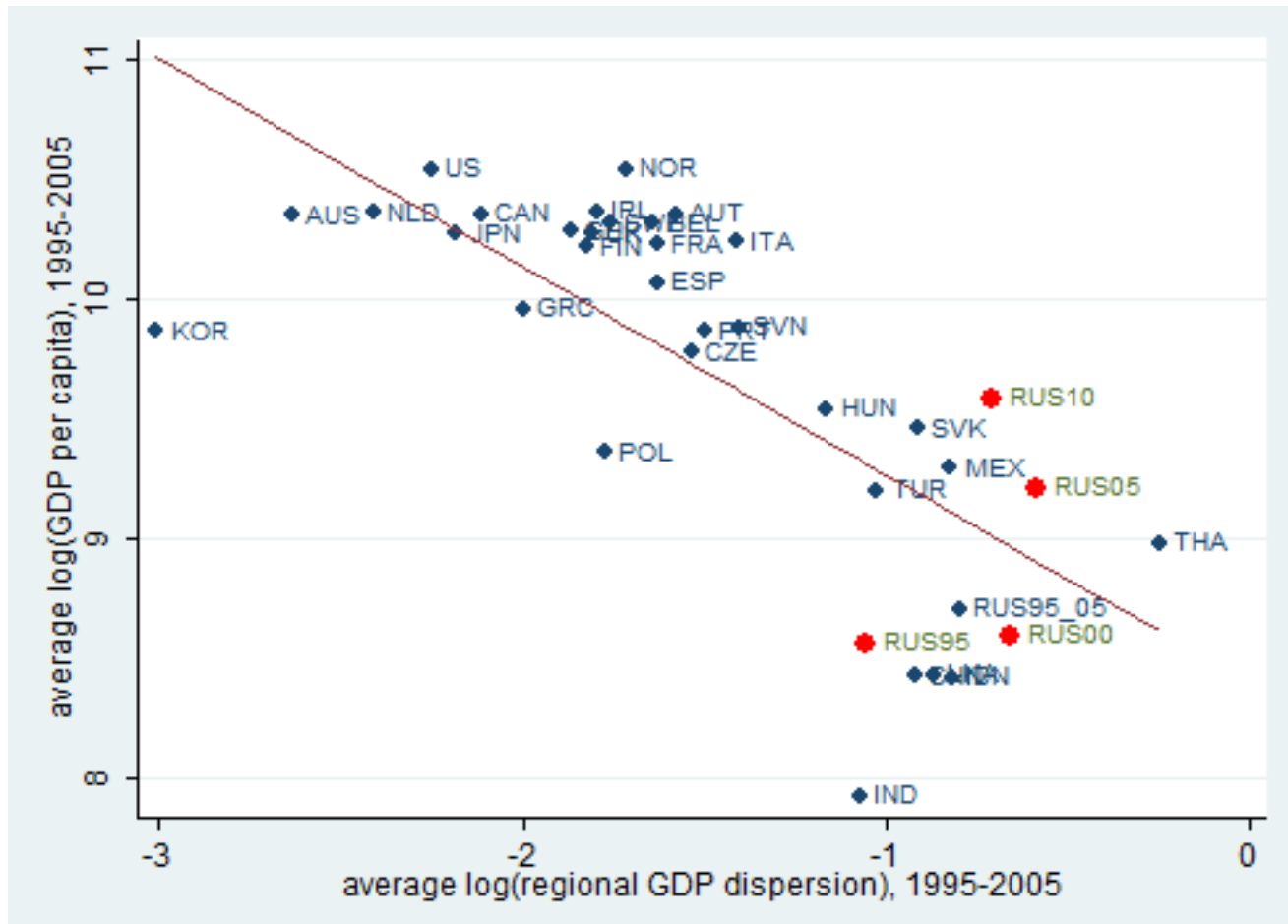
Motivation

- Soviet industrialization was not driven by market logic ⇒
 - Geographical allocation of production was inefficient
 - Transition to market has to involve not only labor mobility but *geographical* mobility
- In 1990s, convergence was *not* happening
 - Explained by underdeveloped financial markets and real estate markets
 - ... and by fiscal redistribution
 - ... and by *poverty traps*

Differences among Russian regions in terms of logarithms of real incomes, real wages, unemployment, real GDP per capita

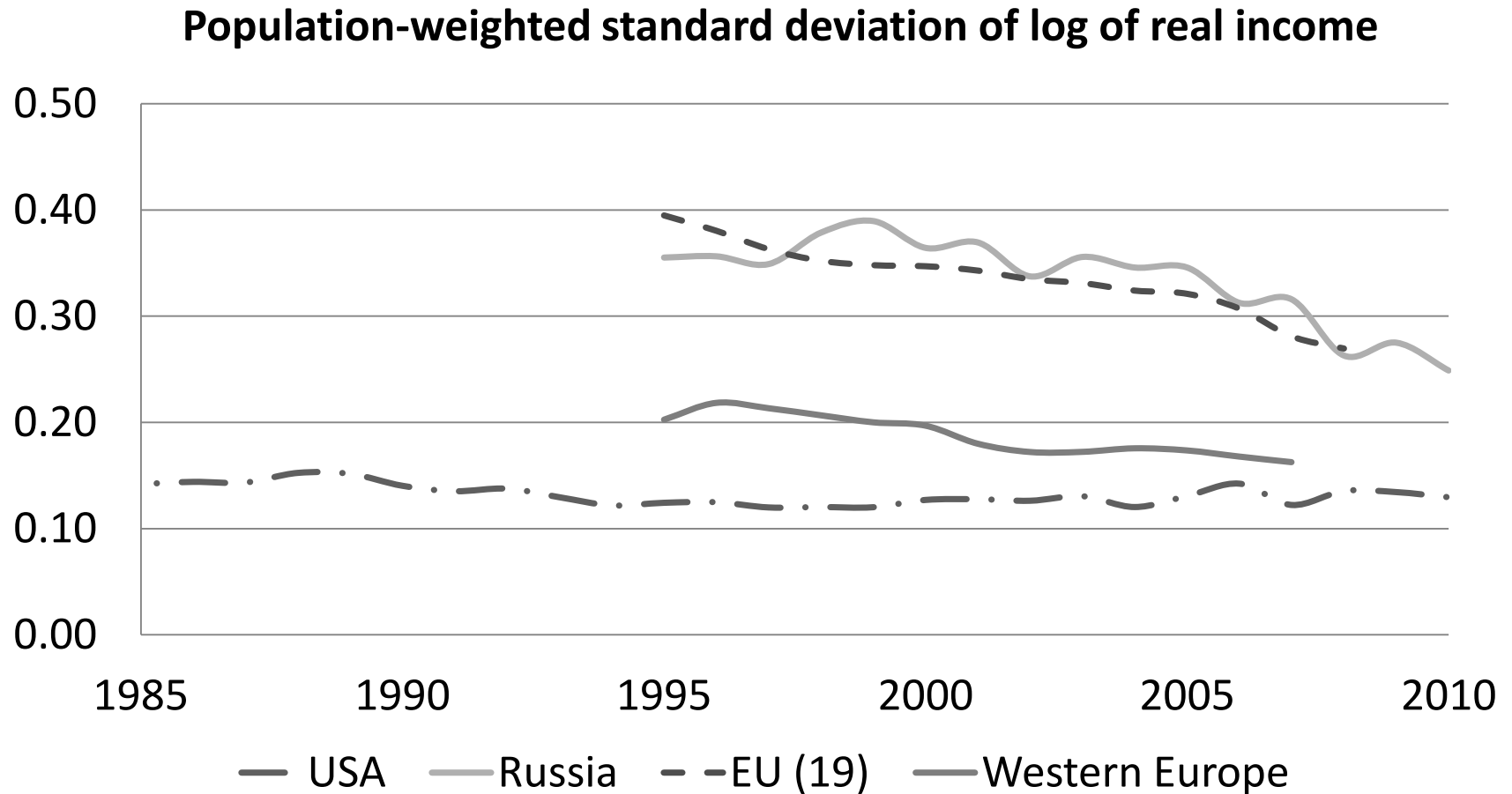


Russia's interregional dispersion in the international context



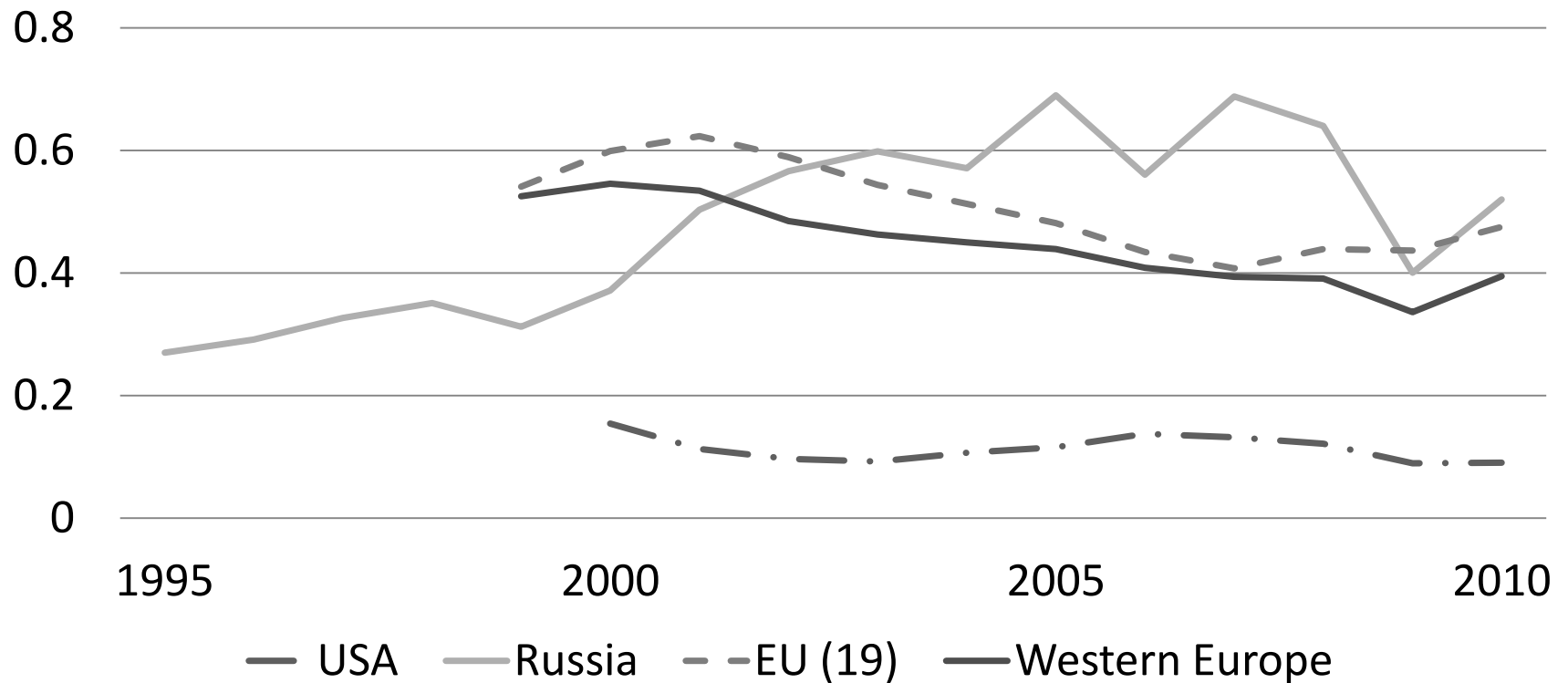
Che and Spilimbergo (2012), authors' calculations for the trend line and Russia.

Convergence in Russia, EU and US



Convergence in Russia, EU and US

Population-weighted standard deviation of log of regional unemployment rates



Another way to measure convergence

- Plot annual growth rate of GDP per capita in the region as a function of log initial level
- If the relationship is negative, convergence is happening
- The slope is the speed of convergence
 - Consider two regions, one having double GDP per capita relative to the other
 - If the slope is -1%, then the gap of 2 times takes $\ln 2 = 70\%/1\% = 70$ years to close
 - If the slope is -5%, then the gap of 2 times takes $\ln 2 = 70\%/5\% = 14$ years to close

Beta-convergence

Period	Real income per capita		Real wage		Real GDP per capita	
	Regression coefficient b	$\beta, \%$	Regression coefficient b	$\beta, \%$	Regression coefficient b	$\beta, \%$
1995-2000	-4.584*** (1.539)	5.2	-3.790*** (1.372)	4.2	1.228 (1.176)	-1.2
2000-2005	-3.439*** (1.213)	3.7	-6.460*** (0.815)	7.8	-0.818 (0.737)	0.83
2005-2010	-6.757*** (0.884)	8.2	-3.207*** (1.111)	3.5	-1.640*** (0.611)	1.7
1995-2010	-3.444*** (0.457)	4.8	-3.676*** (0.456)	5.3	-0.443 (0.499)	0.45
2000-2010	-4.770*** (0.621)	6.4	-4.739*** (0.599)	6.4	-1.217** (0.463)	1.29

Why accelerated convergence?

- Labor mobility?
 - Development of financial and real estate markets
 - Growth, breaking out of poverty traps
- Capital mobility?
 - Development of financial markets
- Fiscal redistribution?

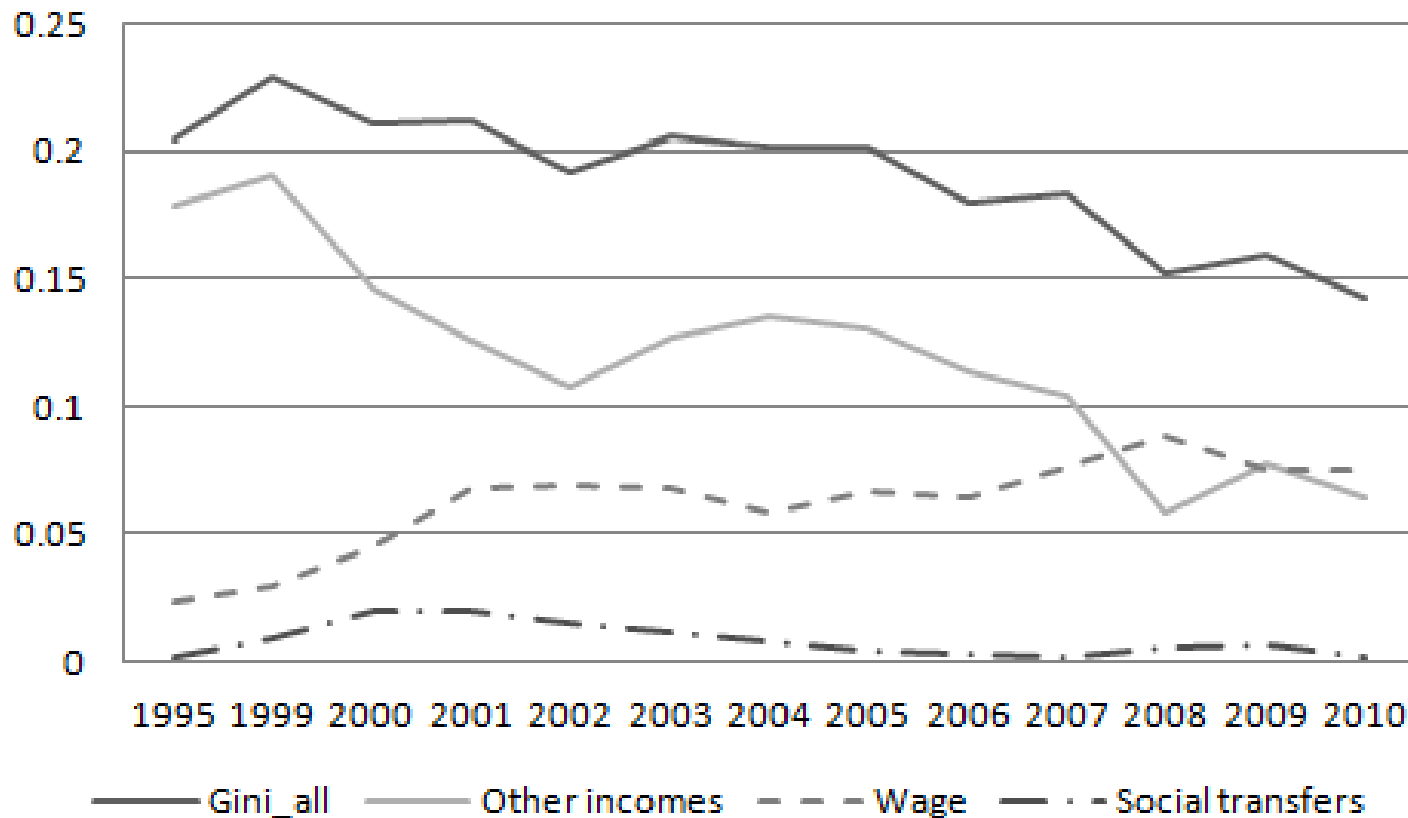
How we answer this question:

- Decompose the convergence process by sources of income: wages, government transfers and other incomes.
- Test whether inter-regional migration increased or decreased and which barriers to migrations were binding during this period of time.
- Undertake a similar study for capital mobility.

DECOMPOSITION OF CONVERGENCE

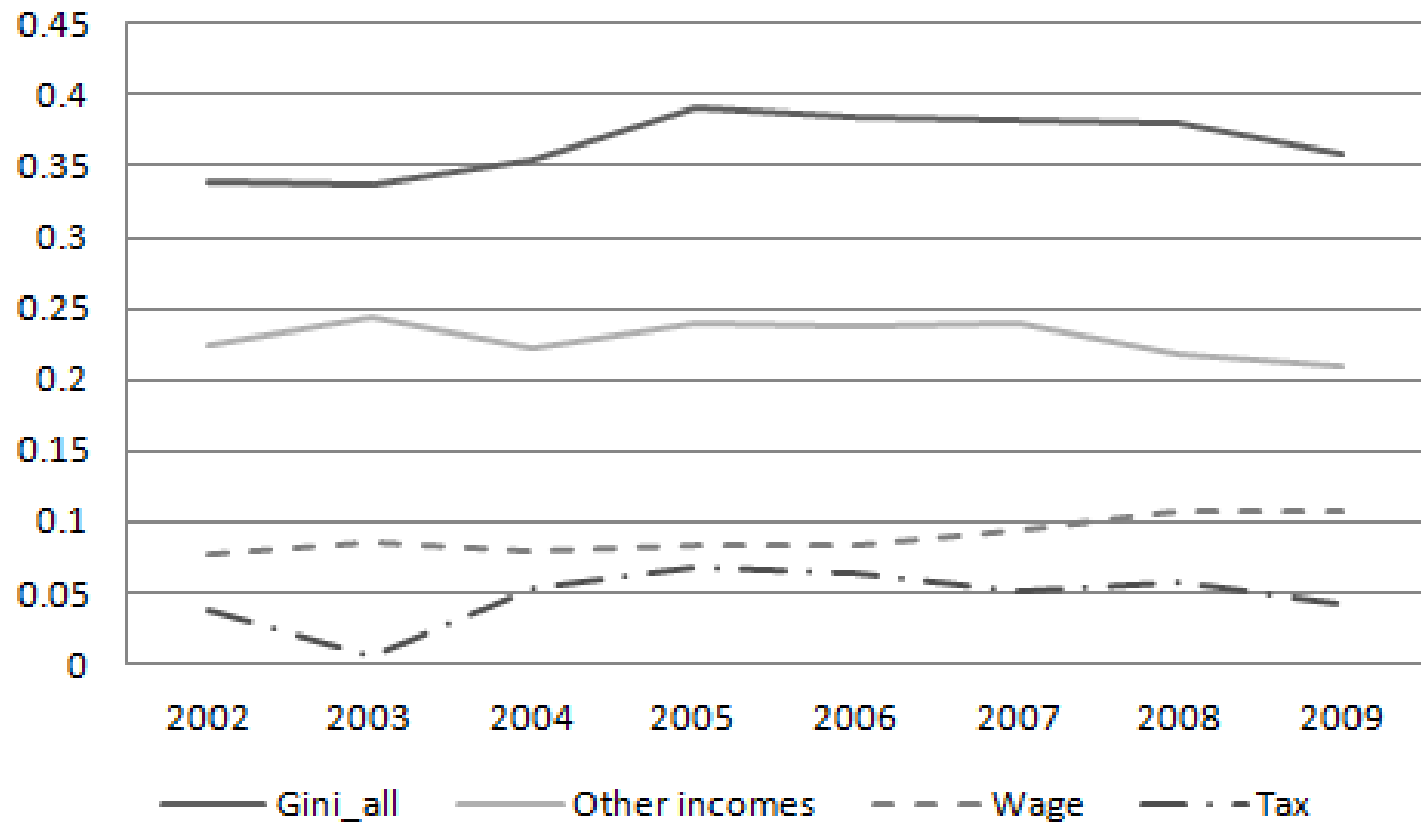
Gini decomposition (Shorrocks, 1983)

Decomposition of Gini for income



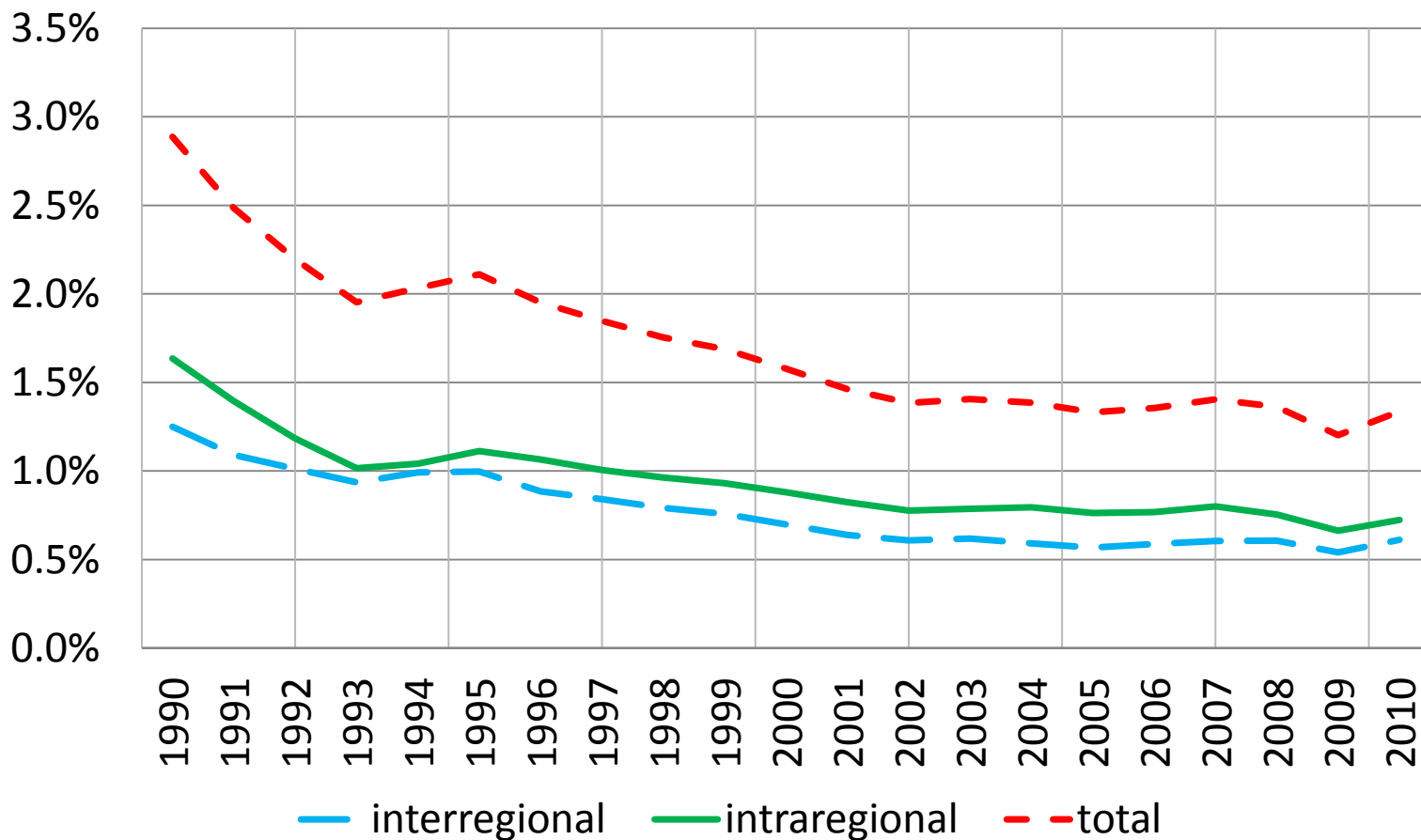
Gini decomposition (Shorrocks, 1983)

Decomposition of Gini for GDP per capita

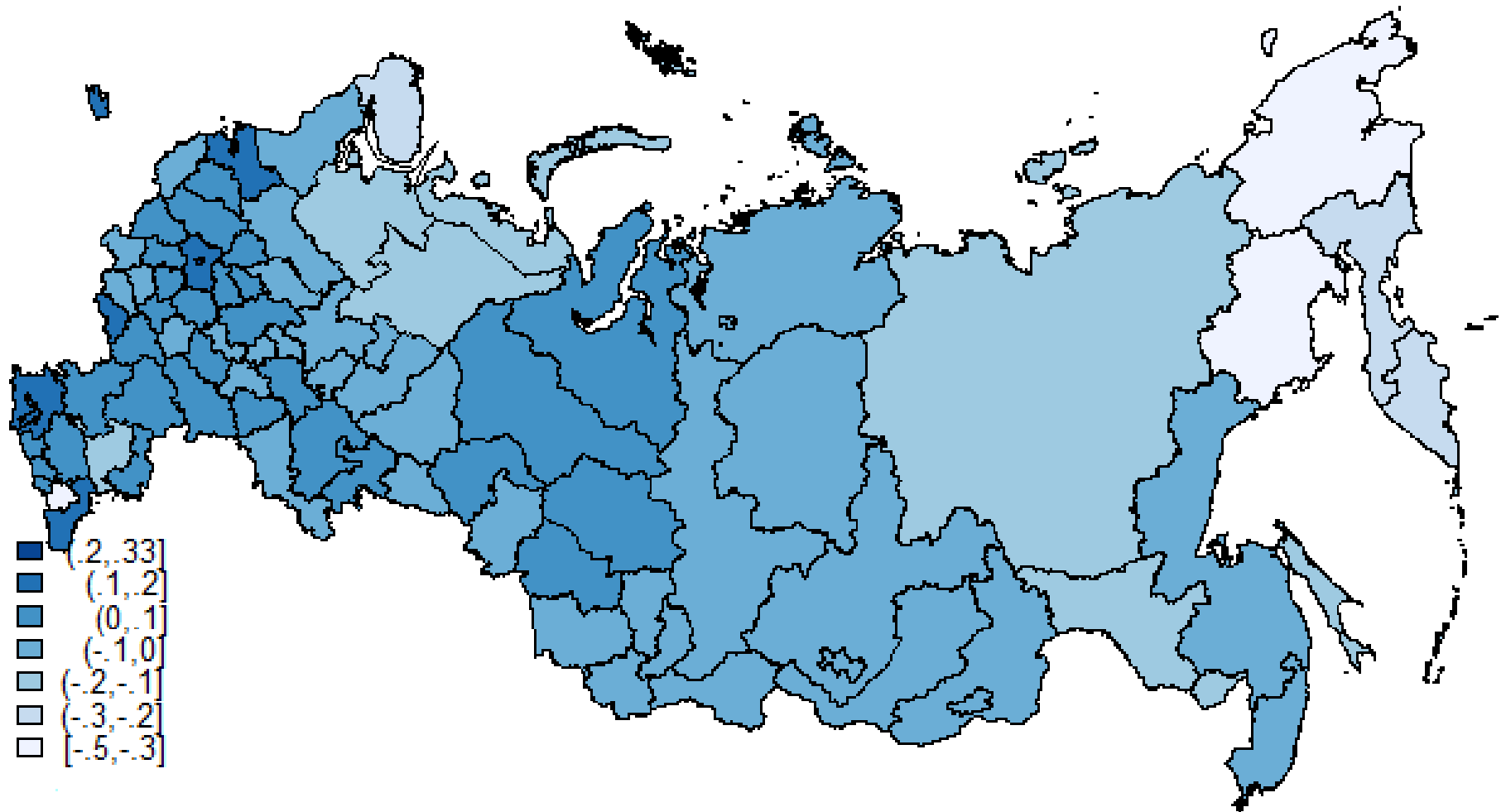


LABOR MOBILITY

Internal migration (interregional, intraregional, total) in Russia over time as % total Russian population



Net migration for the period of 1995-2010, share of 1995 population



Migration rates in Russia and in other countries (interregional migration), % of population

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Russia	0,7	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,5	
USA	3,1	2,8	2,7	2,6	2,6	2,0	1,7	1,6	1,6		
EU (27)			0,4	0,4	0,4	0,3	0,4	0,4			
New Zealand		10,0					9,7				
Japan	2,2	2,2	2,2	2,1	2,1	2,1	2,1	2,1	2,0	2,0	
Canada							2,9				
China											3,0

Modeling migration

- Modified gravity model:

$$\ln M_{ij} = F(D_{ij}, \ln P_i, \ln P_j, \ln Y_i, \ln Y_j, G_i, G_j)$$

M_{ij} – migration from i to j ,

D_{ij} – distance between i and j

P – population, Y – income, G – public goods

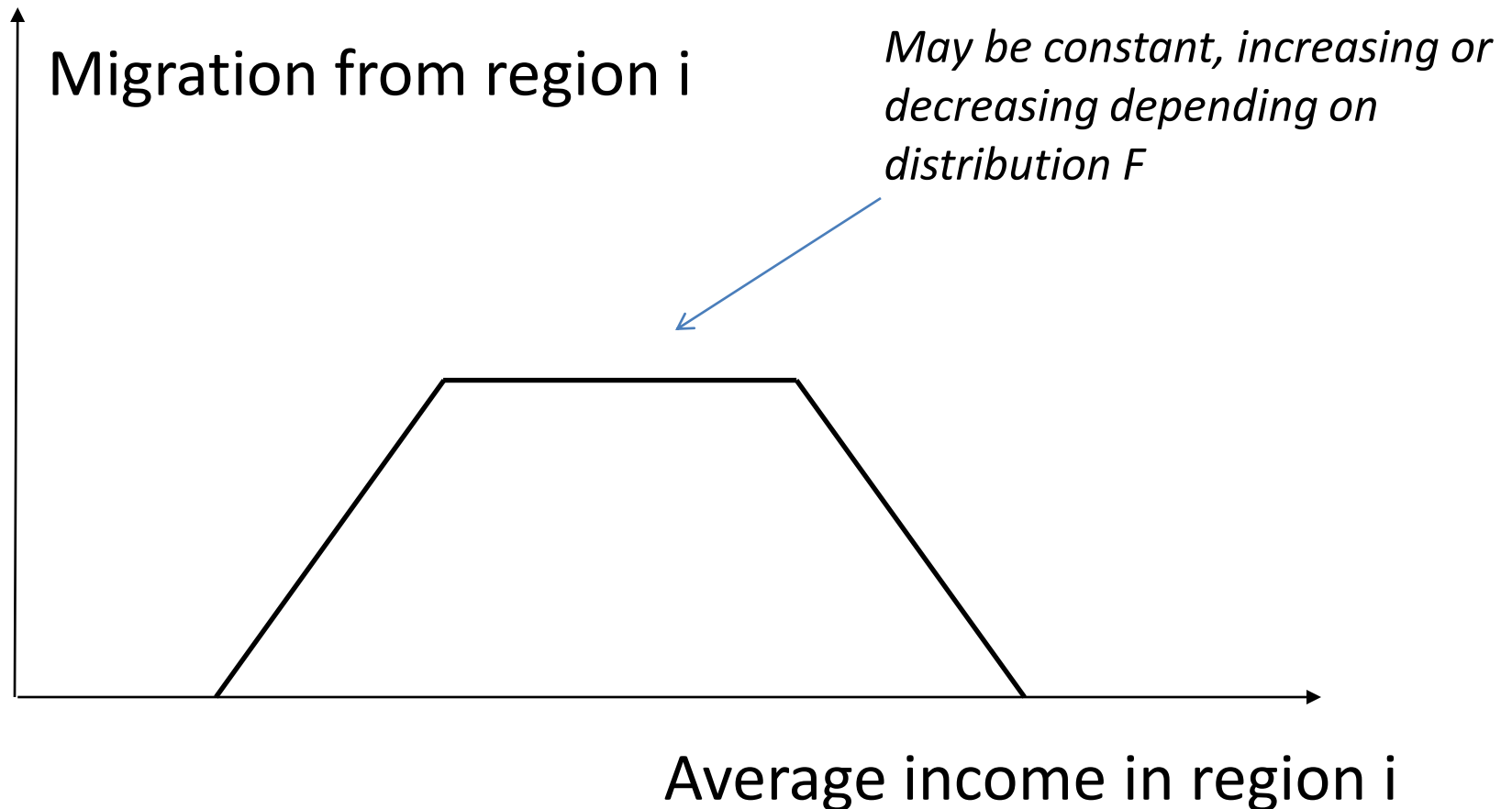
– *Andrienko-Guriev (2004) – also control for pair-wise fixed effects and year dummies*

- Prediction:

– Increases in Y_j, G_j

– Decreases in Y_i, G_i

Migration with financial constraints

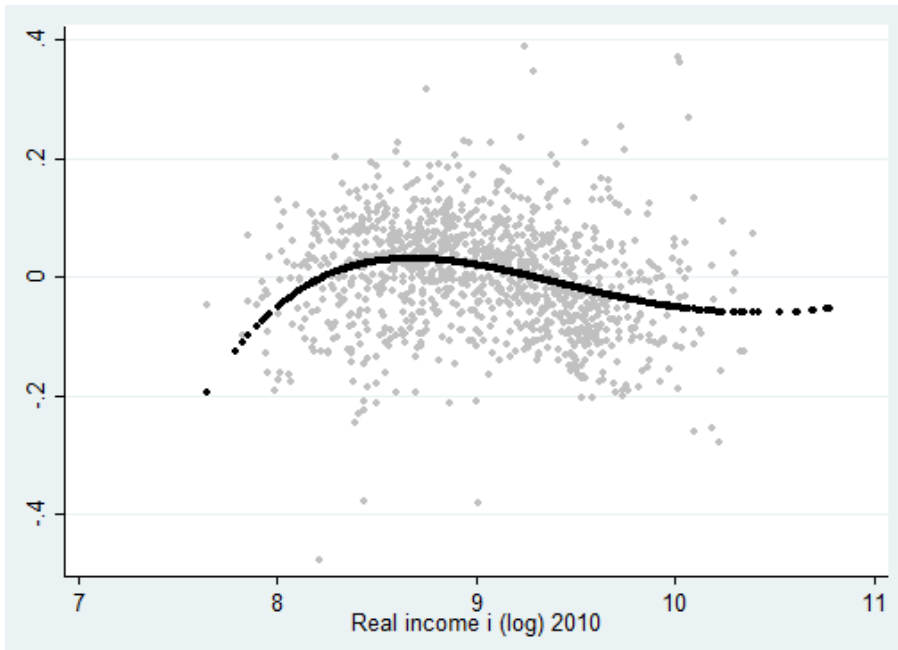


Results of regressions

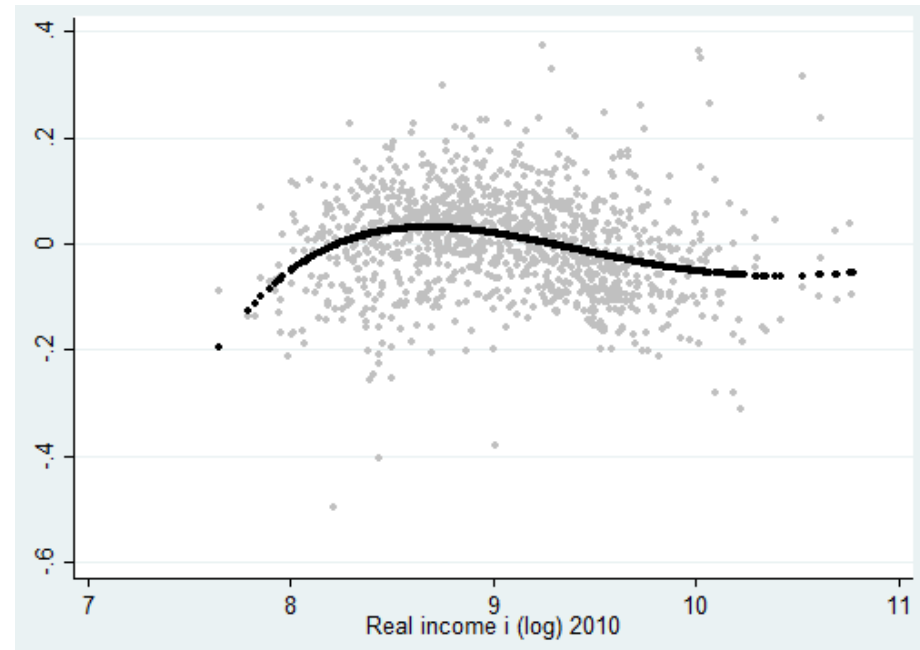
	(1)	(2) w/o M and SPb	(3) Income Squared	(4) Income Squared w/o M and SPb
Ln Pi	2.171***	2.308***	2.204***	2.359***
Ln Pj	2.326***	2.167***	2.334***	2.177***
Ln Yi	0.073***	0.046**	0.166***	0.172***
Ln Yi squared			-0.080***	-0.114***
Ln Yj	0.051***	0.064***	0.075***	0.088***
Ln Yj squared			-0.021	-0.022
Unempl i	0.069***	0.043***	0.067***	0.039***
Unempl j	-0.108***	-0.099***	-0.108***	-0.100***
Public goods, Pairwise FE, Year dummies	YES	YES	YES	YES
Observations	84,360	79,924	84,360	79,924
Number of id	5,929	5,625	5,929	5,625
R-squared	0.295	0.295	0.295	0.296

Non-parametric estimation $\ln M_{ij}$ ($\ln Y_i$)

$$\ln M_{i,j,t} = \alpha_{i,j} + f(\ln \text{income}_{i,t}) + \varphi \ln \text{income}_{j,t} + \sum_{k \in K} \gamma_k \ln X_{k,i,t} + \sum_{k \in K} \delta_k \ln X_{k,j,t} + \sum_{t \in T} \theta_t \text{year}_t + \varepsilon_{i,j,t}$$



All regions



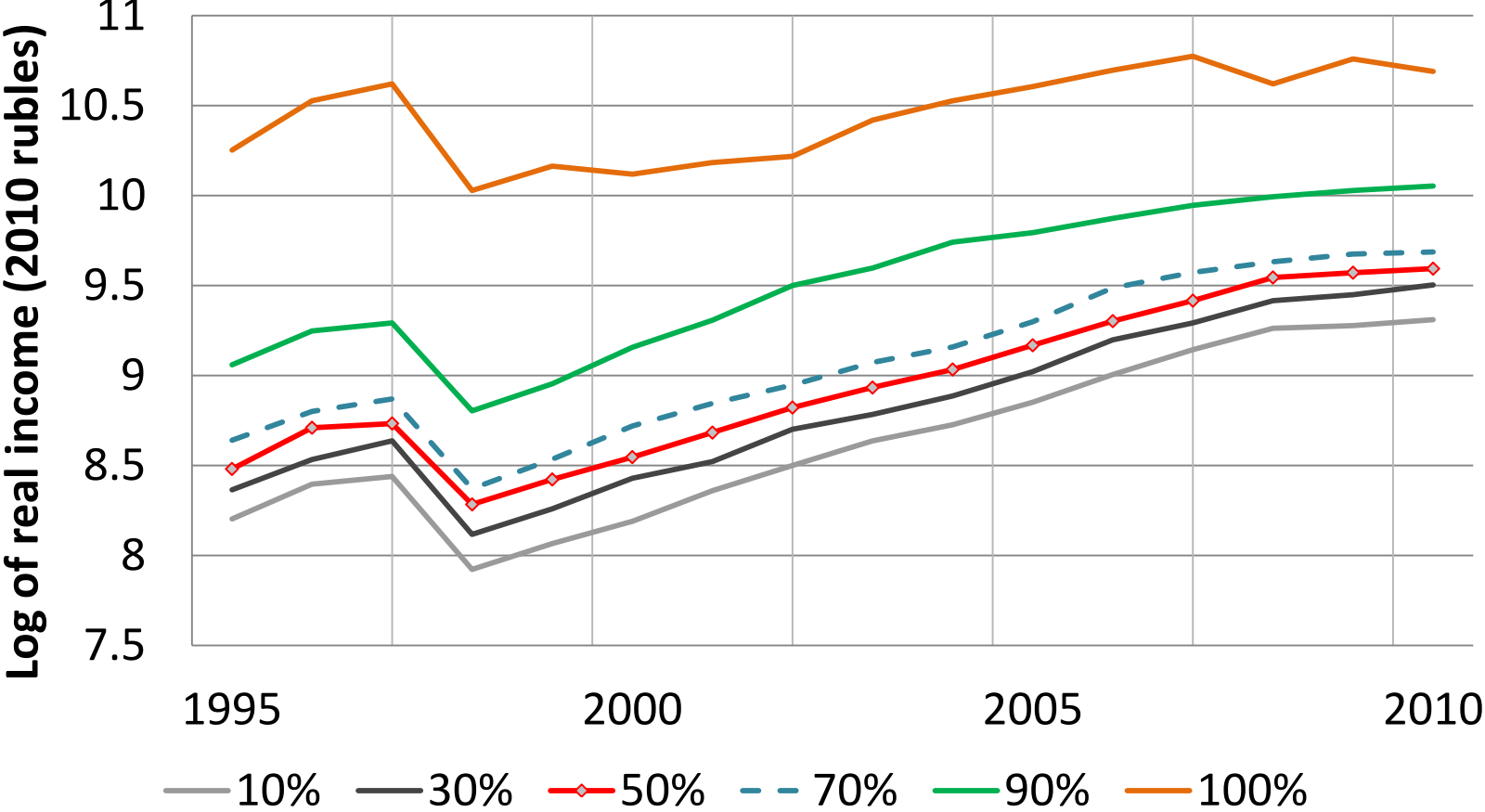
Without Moscow and Saint
Petersburg

Our approach is based on method from Baltagi and Li, (2002)

The value of threshold

N	Model	Threshold	Confidence interval	Russian rubles 2010
1	With squared income	9.24	(8.72, 10)	10301
2	Nonparametric model	8.7	(8.5, 8.9)	6003
3	Models with structural break	9	(8.9, 9)	8103

Distribution of regions by real income



Results

The log real income equal to **9** corresponds to **8103** rubles in 2010 prices. In other words,
89.6% regions were in poverty trap in 1995
84.4% - in 2000
27.2% - in 2005
1.3% (i.e. exactly 1 region, Kalmykia) – in 2010.

Financial development

- We add a proxy for financial development (ratio of loans to households to GDP) and interaction between income and financial development to the regression above.
- **Hypothesis**
- Financial development relaxes the liquidity constraints

Results

- Financial development results in higher outward migration.
- Moreover, the coefficient at the interaction term is negative: migration is less linked to income in the sending region if this region is more financially developed.

CAPITAL MOBILITY

Model for capital

Capital flow = I – S + D

$$\text{Capital flow}_{i,t} = \alpha_i + \beta_1 R_{i,t-1} + \beta_2 \text{Inc}_{i,t} + \beta_3 (K/E)_{i,t-1} + \sum_{t \in T} \theta_t \text{year}_t + \text{other variables} + \varepsilon_{i,t}$$

- **R** - a lag of logarithm of capital income per unit of capital
- **Inc** - income per capita
- **K/E** - the lagged capital to employment ratio
- α_i fixed effects for each region
- year_t - time dummies
- **Controls:** logarithm of population, provision of public goods, e.g., roads, healthcare (doctors per capita and hospital beds per capita), public transportation (buses per capita)

Model for investment

$$Inv_{it} = \alpha_i + \beta_1 S_{it} + \beta_2 BInc_{it} + \beta_3 BExp_{it} + \beta_4 R_{it} + \beta_5 (K/E)_{it} + \text{other variables} + \varepsilon_{it}$$

- Inv - a logarithm of investment in fixed capital
- S - savings
- $BInc$ and $BExp$ - government budget's income and expenditure correspondingly
- Control variables

If $\beta_1 > 0$ and significant, capital market is regionally segmented.

If β_1 is not significant, this implies that capital flows are not generally constrained by regional borders.

Results

- Capital flows to regions with higher returns to capital and lower wages and incomes.
- No significant relationship between investment and savings per capita which rejects the hypothesis that there are interregional barriers to capital mobility.

Conclusion

- In 2000s (especially in the late 2000s) substantial convergence in incomes and wages.
- By 2010, this resulted in reduction of the inter-regional differences in incomes to European levels.
- Direct government transfers did contribute to convergence, their role has been negligible.
- In early 2000s convergence was explained mainly by wages while in later years convergence was due to convergence in other incomes.

Conclusion (2)

- Reduction in barriers to labor mobility has played an important role in convergences in wages and incomes.
- Overall economic growth allowed Russian regions to overcome liquidity constraints through simply growing out of the poverty traps.
- Financial development has also contributed to relaxing liquidity constraints.

Conclusion (3)

- Capital flows to regions with higher return to capital and with lower wages and incomes – and thus contributes to convergence.
- Investment in Russian regions is not correlated to savings – which suggests that capital market is not regionally segmented.

Thank you for your attention!

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