

Regional House Price Dynamics in Russia

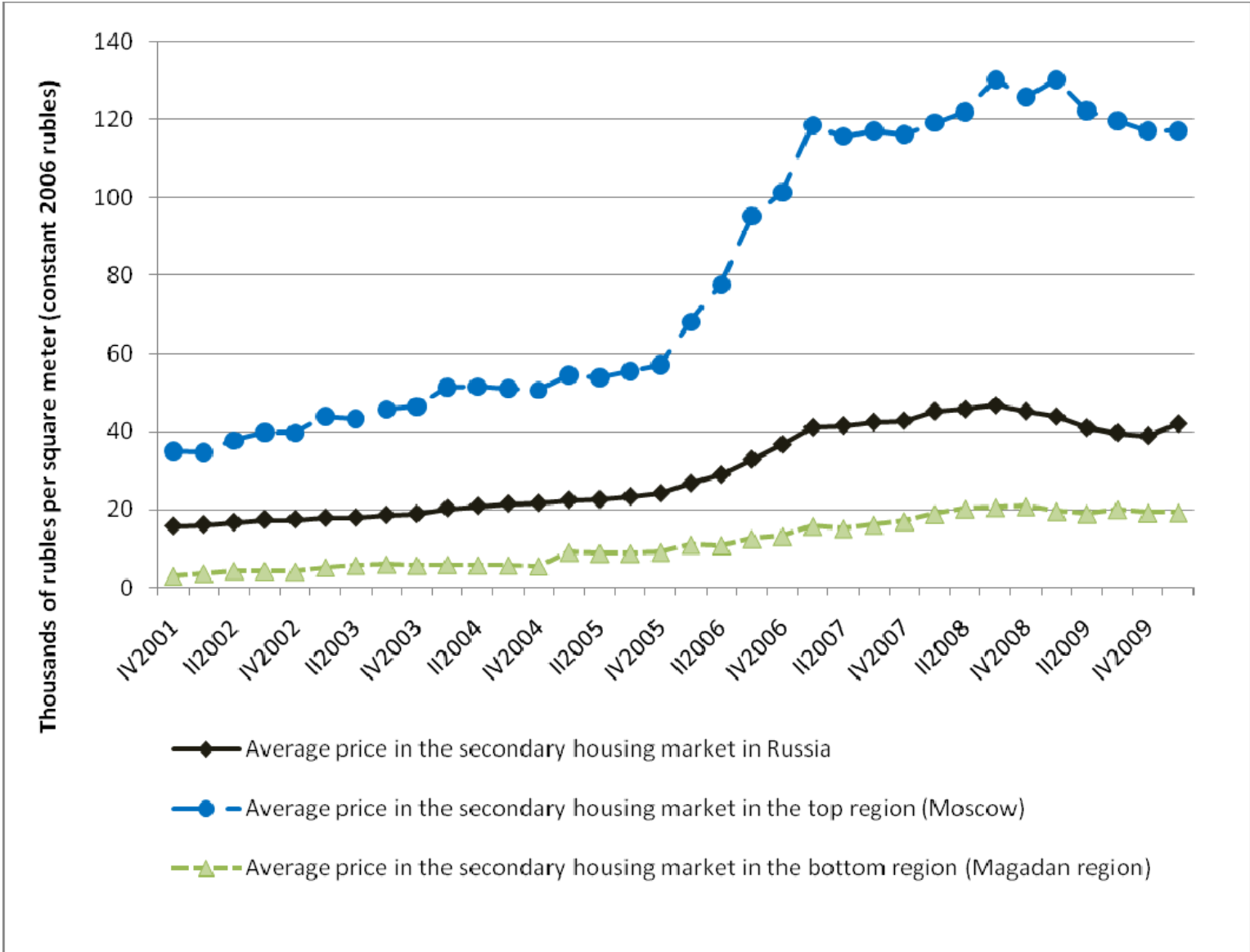
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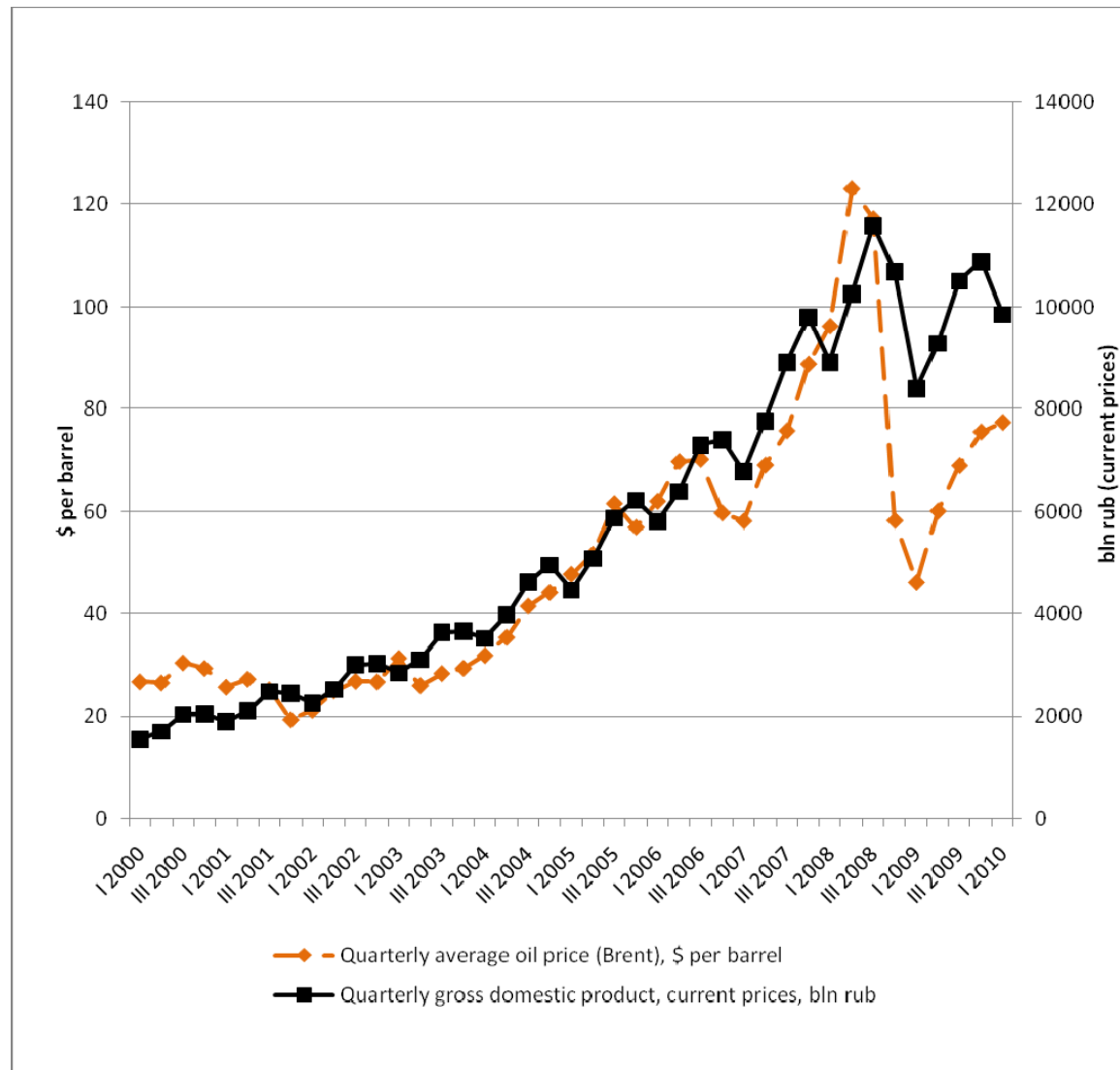
Seminar at the National Bank of Serbia, 17 June, 2011

Evolution of house prices in Russia

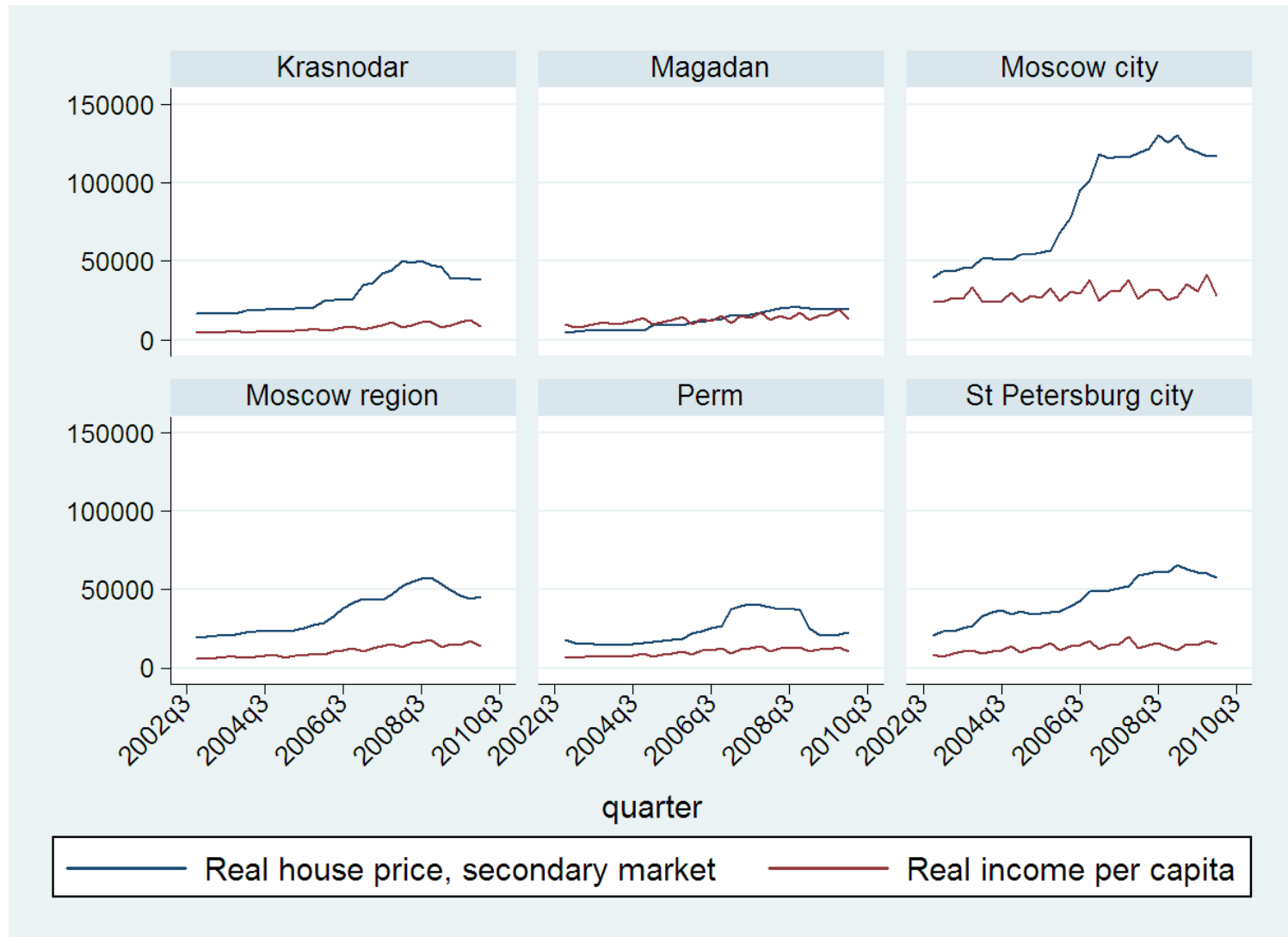
- Unprecedented **increase in house prices** in Russian in the 2000s
- **Price-to-income ratio** of the Russian housing market is now one of the highest in the world: 140 (Global Property Guide)
- For comparison: UK: 46, US and Poland: 35, Germany: 9.
- Graph: **Real house prices on the secondary market** (Rosstat figures)



Overall strong economic growth

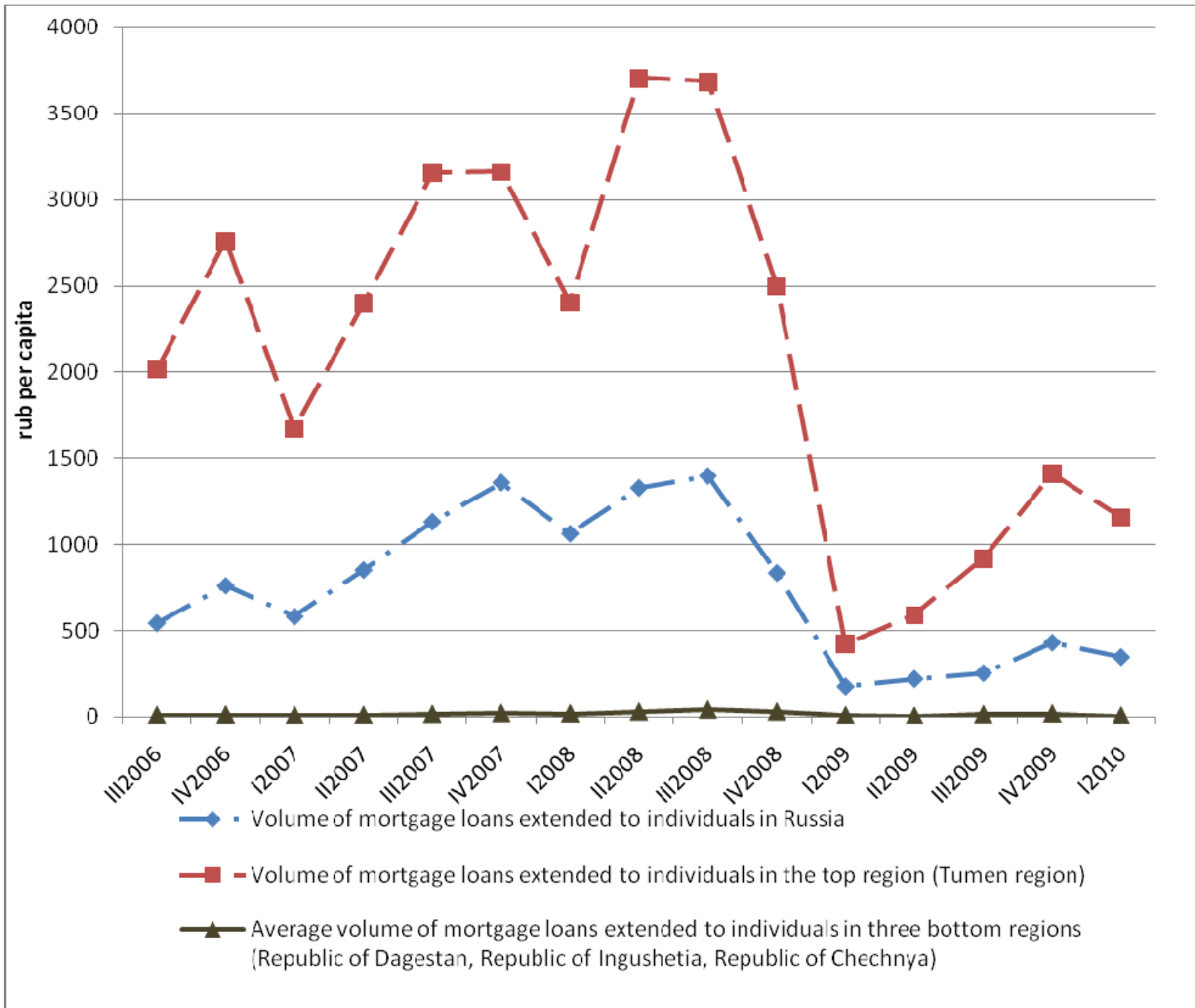


Income and house price development in several Russian regions



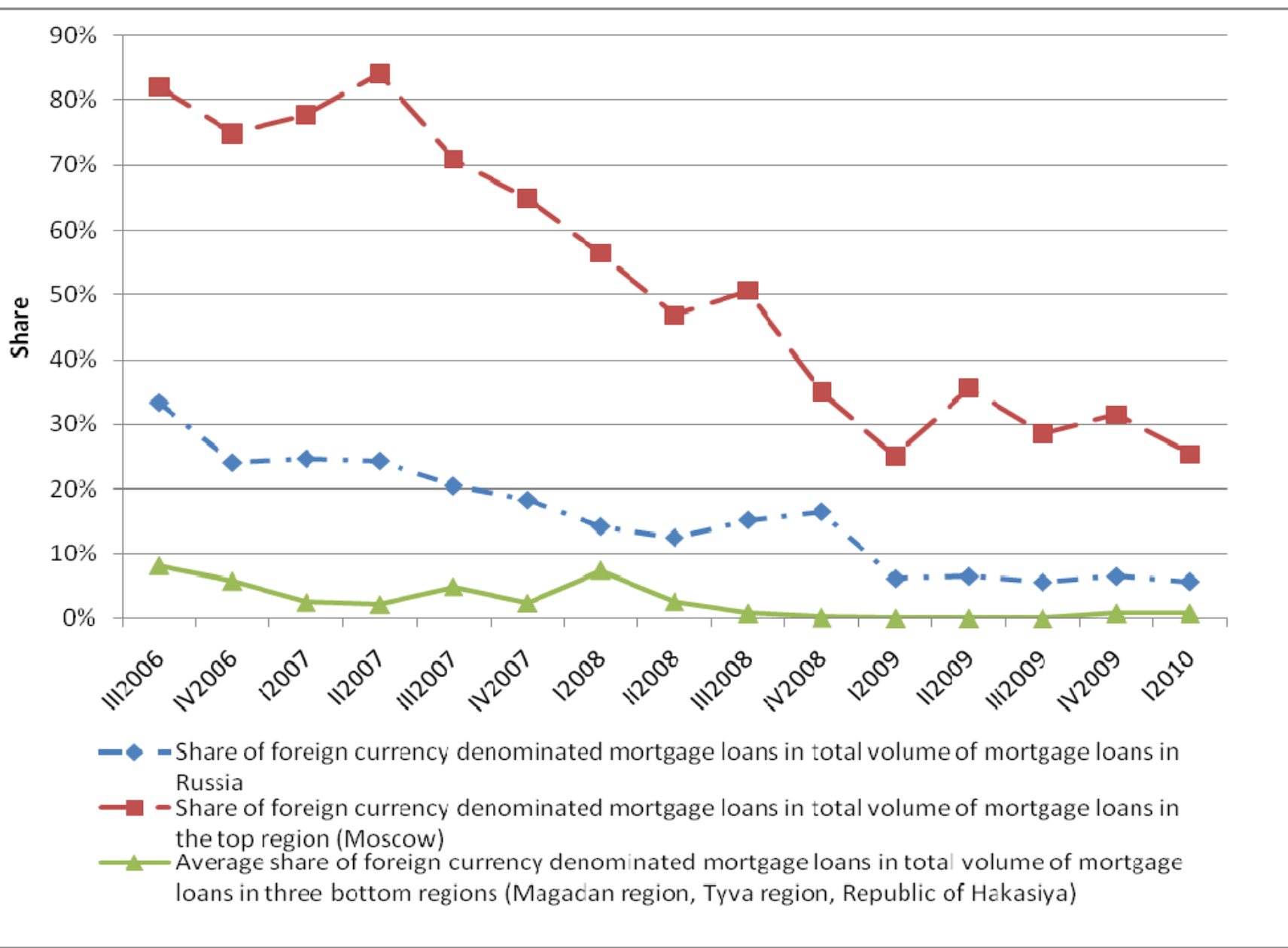
Mortgage lending in Russia

- Mortgage lending started to take off around the year 2006 after the adoption of the necessary laws on foreclosure in the case of non-payment, simplified registration of property rights, credit bureaus etc.
- Graph: [Volume of new mortgage loans per capita, 2006-2010](#)



Currency composition of mortgage loans

- Before the crisis, a non-negligible proportion of loans were given in foreign currency (around 15% in 2008Q3 in Russian, and 50% in Moscow, mainly US dollars)
- Due to the depreciation of the ruble borrowers had major problems in serving these loans.
- Graph: [Currency composition](#) of mortgage loans, 2006-2010.

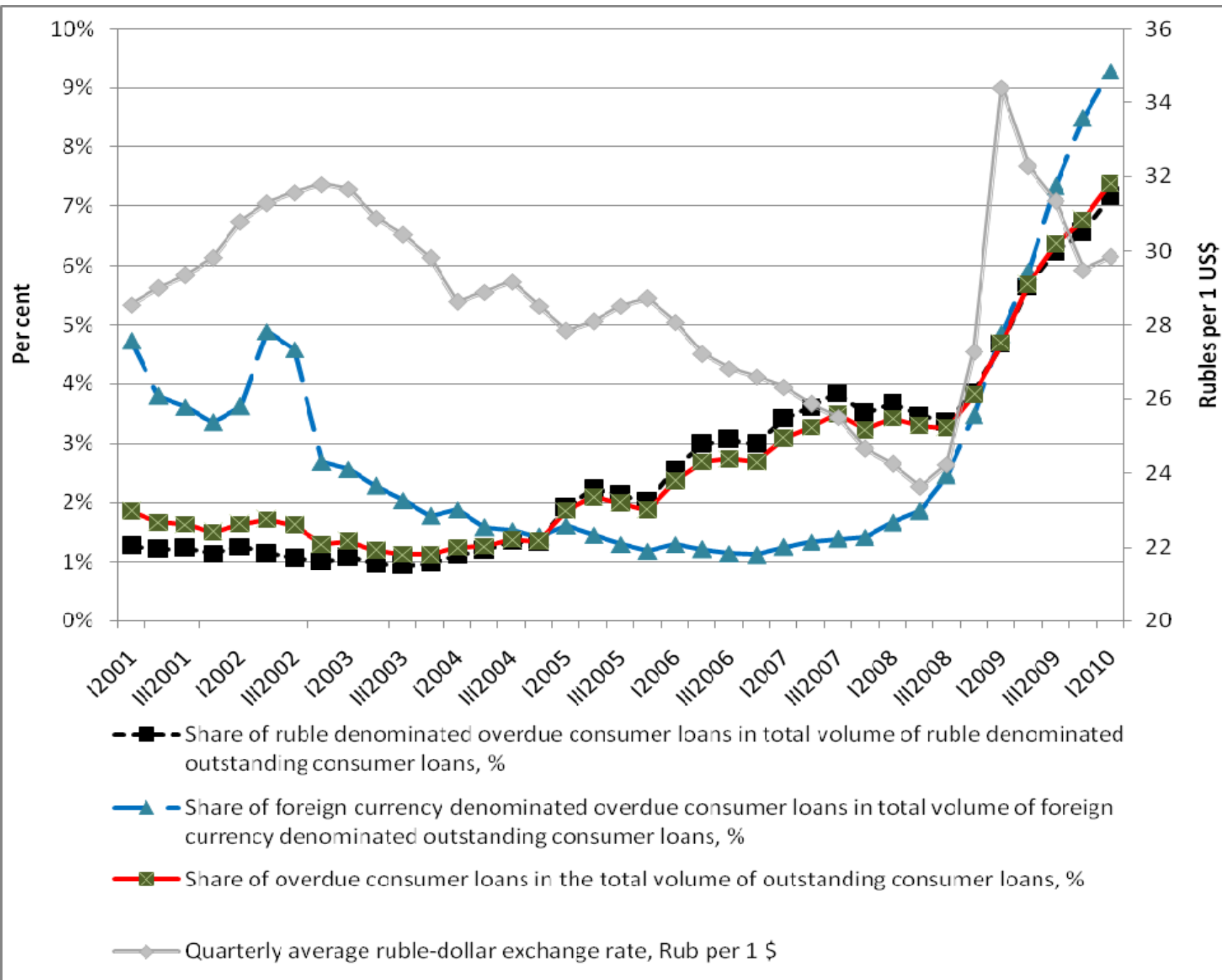


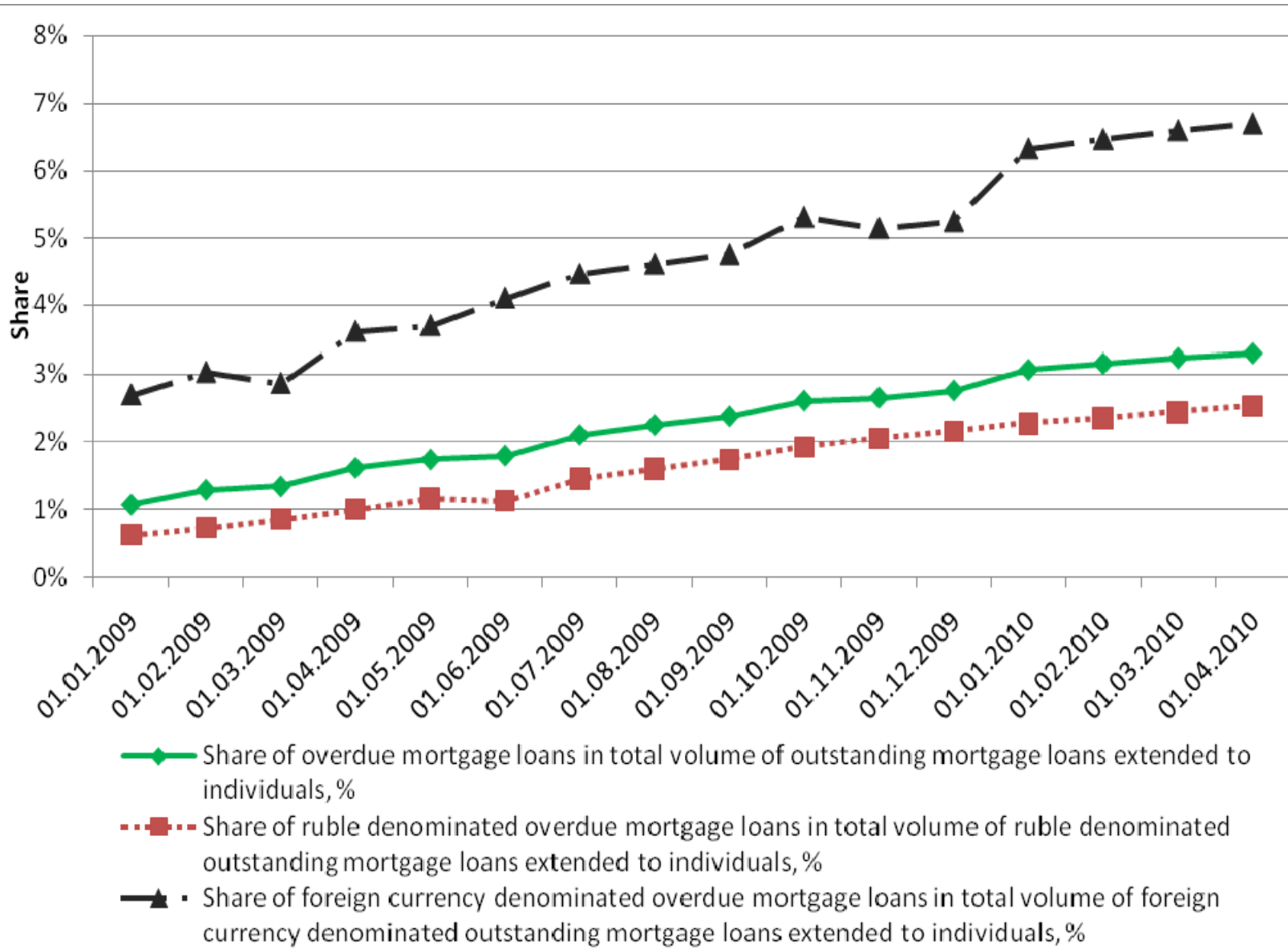
Financial crisis and non-payment of loans

- As a consequence, the fraction of overdue loans in total outstanding mortgage loans has increased much more for dollar-dominated loans.
- This is an **example of inadequate risk management** by banks who perceived mostly the reduction in exchange rate risk, but not the increase in credit risk from dollar-denominated loans.
- In 2010, the fraction of foreign-currency denominated mortgage loans in the volume of newly issued mortgage loans has decreased to less than 2 per cent.

Non-payment, cont'd

- Graphs:
- 1. Fraction of overdue loans in total outstanding consumer loans and the ruble-dollar exchange rate
- 2. Fraction of overdue loans in total outstanding mortgage loans: ruble and foreign currency denominated loans and total





Econometric analysis of house price determinants

- We analyze first the **variation of house prices across regions** using simple cross-sectional OLS regressions for the years 2006, 2007 and 2008
- Groups of **explanatory variables**:
 - **Purchasing power of households**: income per capita, unemployment rate and the volume of mortgage loans granted within the year
 - **Demographic variables**: annual number of marriages in the region, growth rate of active population
 - **Supply-side conditions** of regional housing markets: existing housing stock, fraction of outdated housing stock in the total housing stock, cost of construction, price elasticity of housing supply

Econometric analysis of house price determinants, cont'd

- Groups of explanatory variables, cont'd
 - **Socio-economic indicators of regions**: importance of natural resources (the fraction of mining in industrial production), crime rate, index of investment risk
 - **Dummy for Moscow and St Petersburg**
- Table: Cross-sectional (OLS) regressions of the logarithm of house prices on the secondary market across Russian regions, parsimonious models for the years 2006, 2007 and 2008.

Variable	2006		2007		2008	
Unemployment			-0.028	(-3.31)	-0.013	(-2.09)
Growth of active population	-2.095	(-3.60)	1.725	(2.51)	-1.160	(-1.81)
Log of construction cost	0.342	(3.39)	0.354	(4.01)		
Log of income per capita	0.485	(5.50)	0.197	(2.44)	0.454	(5.64)
Log of housing stock per capita	-0.463	(-2.56)	-0.829	(-3.77)	-0.580	(-2.85)
Share of mining in industrial production	-0.292	(-2.26)				
Risk index	-0.676	(-7.50)	-0.478	(-4.77)	-0.334	(-2.72)
Moscow / St.			0.456	(3.04)	0.543	(3.90)
Elasticity of supply	-0.248	(-4.46)	-0.098	(-2.04)		
constant	4.884	(6.01)	8.431	(7.18)	8.570	(8.06)
R ² (%)	0.77		0.76		0.69	
Adjusted R ² (%)	0.74		0.73		0.66	
Number of observations	77		77		78	

Panel data evidence

- We use quarterly data of house prices and a wide range of explanatory variables.
- We follow a recent literature that has used the pooled mean group estimator (Pesaran, 1999).
- It integrates the estimation of a long-run (equilibrium) relationship and a short-run adjustment equation
- The coefficients in the long-run relationship (except for a constant term) are assumed to be homogeneous across all regions while the speed of adjustment and the coefficients of all variables in the adjustment equation can vary across regions.

Panel data evidence, cont'd

- Specification 1: include logarithm of the real monthly disposable income per capita and the real interest rate = national loan rate minus regional inflation
- Specification 2: include additionally population growth, unemployment rate, and change in the volume of outstanding consumer loans.
- Table: Pooled mean group (panel) estimations for the logarithm of average house prices on the secondary market in Russian regions, 2003Q1-2010Q1

Variable	Specification 1		Specification 2	
Log income per capita	0.958	<i>28.72</i>	0.512	<i>6.10</i>
Real interest rate	-0.016	<i>-9.69</i>	-0.006	<i>-5.25</i>
Population growth			0.209	<i>2.08</i>
Unemployment rate			-16.946	<i>-12.23</i>
Log change in outstanding consumer loans			0.083	<i>4.96</i>
Adjustment coefficient	-0.130	<i>-11.98</i>	-0.159	<i>-12.28</i>
Log Likelihood	3037.3		3180.9	
Number of observations	2251		2173	

More sophisticated estimators

- Holly et al. (2010) apply the common correlated effects (CCE) estimator to US house prices
- It accounts for
 - Non-stationarity
 - Full heterogeneity of individuals (regions)
 - Cross-sectional dependence in error terms
- Current research: CD tests, unit root, cointegration tests, application the CCE estimator

Conclusion

- We have presented evidence on house prices, the volume of mortgage loans, their currency denomination, and default rates, highlighting significant regional differences.
- The econometric evidence shows that the regional variation as well as the time series behavior of house prices in Russia can be well explained by traditional driving factors such as income per capita, unemployment rate, construction costs, existing housing stock, interest rates and population growth.
- The development of the banking system in a region (which we proxy by the volume of consumer loans) is an additional driving force leading to higher house prices.