Real Estate Modelling

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Tutorial 4: Regression II – Panel

Learning Outcomes	R Functions	Libraries	Data
		`bdsmatrix`	
		`collapse`	
		`sandwich`	
		`lmtest`	
		`maxLik`	
		`generics`	
		`miscTools`	
		`Rdpack`	
		`rbibutils`	
		`Formula`	
Be able to merge data sets into a single data frame	`dim()`; `merge()`		Bulwien_Gesa Bulwien_Gesa_Geodat
Know how to plot data on a simple polygon map	`map()`	`maps`	
		`mapdata`	worldHires database
Be able to use text markers to plot data	`text()`; `unique()`		
Know how to calculate variable mean by group	`tapply()`		
Be able to add circle markers of spec. size & colour	`symbols()`; `rgb()`		
Know how to adjust scientific notation setting	`options()`		
Practice running linear regression using R	`lm()`		
Know how to query variables' standard deviation & apply it for interpretation of regression output	`sd()`		
Learn about `plm` package for panel data regression	`vignette()`	`plm`	
Know how to set data to panel data	`pdata.frame()`		
Be able to perform panel regression with two-way fixed effects, using the `plm` package	`plm()`		

Practical 1: Data Preparation and Exploration

a. Load the **Bulwien_Gesa** and **Bulwien_Gesa_Geodat** data into R Studio and merge the two data sets.

b. Plot the city-locations on a map of Germany using the `map()` function and using the city names as markers.

c. Using circle markers, add information on cities' average economic activity to the map.

Practical 2: Regression Analysis

a. Run simple OLS regressions, with and without variable transformations, to enquire into the relationship between office rents and employment.

b. Use a log-log specification to model the relationship between office rents and employment. Include a full set of dummy variables (DVs) for time periods as well as observation entities in your model.

c. Replicate your result from part b. using the `plm` package.

d. Add further regressors to the model.