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- What migration trends can be identified in Vienna across time and space?
- What is the relationship between migration in a given district and the election results in the Austrian national elections of 2024

In addition to the original dataset, three other datasets were mainly used:

1. **Migration Statistics:** source: [data.gv.at](https://data.gv.at). Per district yearly net migration. The data is aggregated by gender, nationality (Austrian or non-Austrian), and migration target/source: abroad, Austria, or within Vienna. 2007 - 2023
2. **Election results:** 2024 national election results for each district in Vienna from the Vienna government agency [www.wien.gv.at](https://www.wien.gv.at).
3. **Rent Prices:** The average rent prices per square meter in each district from the website [www.immopreise.at](https://www.immopreise.at), with the original source being *Der Standard*.

- Adding population data to transform migration into a percent of current population → accounts for difference in size of district
- Adding Sociodemographic data for 2023
- Adding rent prices for 2023
- Adding geo data to create maps
- Adding election results data per district for 2024

Data Sources: <https://www.data.gv.at/>; <https://www.immopreise.at/>;  
<https://www.wien.gv.at/wahlergebnis/de/NR241/index.html>

Figure 1 consists of four maps of the Istanbul Metropolitan Area, each showing migration patterns at different scales. The maps are arranged in a 2x2 grid. The top row shows migration patterns at the district level, while the bottom row shows migration patterns at the neighborhood level. The left column shows net foreign migration, and the right column shows net migration between districts.

- Top-left map:** Average yearly net Foreign migration. The legend ranges from 0.2 (dark blue) to -0.3 (dark red). The map shows a mix of positive and negative migration across districts.
- Top-right map:** Average yearly between Beziir net migration. The legend ranges from 0.2 (dark blue) to -0.3 (dark red). The map shows a mix of positive and negative migration across districts.
- Bottom-left map:** Average yearly net Foreign migration. The legend ranges from 0.00 (light blue) to 1.00 (dark blue). The map shows a mix of positive and negative migration across neighborhoods.
- Bottom-right map:** Average yearly between Beziir net migration. The legend ranges from 0.50 (dark blue) to -0.50 (dark red). The map shows a mix of positive and negative migration across neighborhoods.

**Rent prices:** A positive correlation between net migration of Austrians and rent prices was found, indicating that Austrians tend to prefer more expensive districts. In contrast, foreign nationals exhibit a different behavior: there is a negative correlation between their net migration and rent prices, suggesting they favor more affordable districts.

**Election results:** Increased migration of Austrian nationals is linked to poorer election outcomes for FPÖ and ÖVP, while benefiting Die Grüne. In contrast, increased migration of foreign nationals shows the opposite trend. Within Vienna, migration of foreign nationals is most strongly associated with higher support for FPÖ.

A scatter plot showing the relationship between Average Austrian migration (%) on the x-axis and PPO sales (%) on the y-axis. The x-axis ranges from 0.0 to 0.2, and the y-axis ranges from 10 to 30. The plot shows a negative correlation, with data points numbered 1 through 22. A grid is visible in the background.

Point Number	Avg Austrian migration (%)	PPO sales (%)
11	0.05	31
21	0.08	29
19	0.10	27
22	0.12	26
14	0.18	19
20	0.19	20
13	0.20	17
15	0.21	18
16	0.22	17
18	0.23	16
37	0.24	15
2	0.25	15
1	0.26	14
17	0.27	12
15	0.28	16
3	0.29	14
5	0.30	13
4	0.35	11
8	0.40	9
9	0.41	9
6	0.42	9
7	0.38	8

**Comparison of beta coefficients for modelling party support in Vienna**

The figure is a forest plot comparing beta coefficients for eight terms across three models. The x-axis is labeled 'Estimate' and ranges from -1.5 to 1.0, with a vertical dashed line at 0.0. The y-axis is labeled 'term'. The terms are: party\_term, income, nat\_p\_sud, local\_internal\_p\_sud, nat\_p\_for, local\_nat\_p\_for, age, and local\_nat\_p\_sud. For each term, three horizontal lines represent the estimates and their confidence intervals for the full model (blue), the model excluding the 'other' category (pink), and the model excluding the 'green' category (green). The 'other' category (pink) generally shows smaller estimates compared to the 'green' category (green) for most terms.

term	Full Model (Blue)	Model Excl. 'other' (Pink)	Model Excl. 'green' (Green)
party_term	Estimate: -0.1, CI: [-0.4, 0.2]	Estimate: -0.4, CI: [-0.7, -0.1]	Estimate: 0.1, CI: [-0.2, 0.4]
income	Estimate: -0.1, CI: [-0.4, 0.2]	Estimate: -0.2, CI: [-0.5, 0.1]	Estimate: -0.3, CI: [-0.6, 0.0]
nat_p_sud	Estimate: -0.4, CI: [-0.7, -0.1]	Estimate: 0.3, CI: [0.0, 0.6]	Estimate: 0.7, CI: [0.4, 1.0]
local_internal_p_sud	Estimate: 0.0, CI: [-0.3, 0.3]	Estimate: -0.2, CI: [-0.5, 0.1]	Estimate: -0.4, CI: [-0.7, -0.1]
nat_p_for	Estimate: 0.6, CI: [0.3, 0.9]	Estimate: -0.1, CI: [-0.4, 0.2]	Estimate: -1.0, CI: [-1.3, -0.7]
local_nat_p_for	Estimate: 1.0, CI: [0.7, 1.3]	Estimate: -0.3, CI: [-0.6, 0.0]	Estimate: -1.1, CI: [-1.4, -0.8]
age	Estimate: 0.8, CI: [0.5, 1.1]	Estimate: -0.4, CI: [-0.7, -0.1]	Estimate: -0.6, CI: [-0.9, -0.3]
local_nat_p_sud	Estimate: 0.0, CI: [-0.3, 0.3]	Estimate: -0.1, CI: [-0.4, 0.2]	Estimate: -0.2, CI: [-0.5, 0.1]

The figure displays a Jupyter Notebook interface with a workflow for predicting the number of foreign tourists (FP0) based on migration flow data. The workflow is organized into three main sections, each with a colored background (orange, green, and blue).

**Section 1 (Orange):** This section focuses on data loading and initial processing. It starts with a 'CSV Reader' block labeled 'Loading the migration flow dataset'. This is followed by a 'Column Filter' block ('Removes unnecessary columns: ("NUTS", "REF\_DATE")'), a 'Column Renamer' block ('Renames columns for clarity'), a 'String Manipulation' block ('Adjusts the "bezirk", "zählbezirk", and "sex" columns for interpretability'), a 'Missing Value' block ('Checks for missing values'), and a 'Math Formula' block ('Verifies multiple conditions: "net" equals the sum of "ext\_net" and "int\_net", etc...').

**Section 2 (Green):** This section involves data cleaning and feature engineering. It begins with a 'Table Creator' block ('Creates the "Rent Data" table with district codes and rent prices CSV Reader'), followed by a 'CSV Reader' block ('Imports the income data'), another 'CSV Reader' block ('Imports demographic indicators dataset'), and a 'Joiner' block ('Merges the migration, population and income dataset with demographic indicators dataset based on "District"').

**Section 3 (Blue):** This section is dedicated to model training and evaluation. It starts with a 'Column Filter' block ('Focus on predicting FP0'), followed by a 'Feature Selection Loop Start (1:1)' block ('Start the model with all features'), a 'Linear Regression Learner' block ('Evaluate R<sup>2</sup>, AIC, RMSE, and VIF'), a 'Statistics' block ('Select relevant features'), a 'Feature Selection Loop End' block ('Select relevant features'), another 'Linear Regression Learner' block ('Performs linear regression with FP0 results as the independent attribute'), and finally a 'Scatter Plot' block ('Plots the regression line').