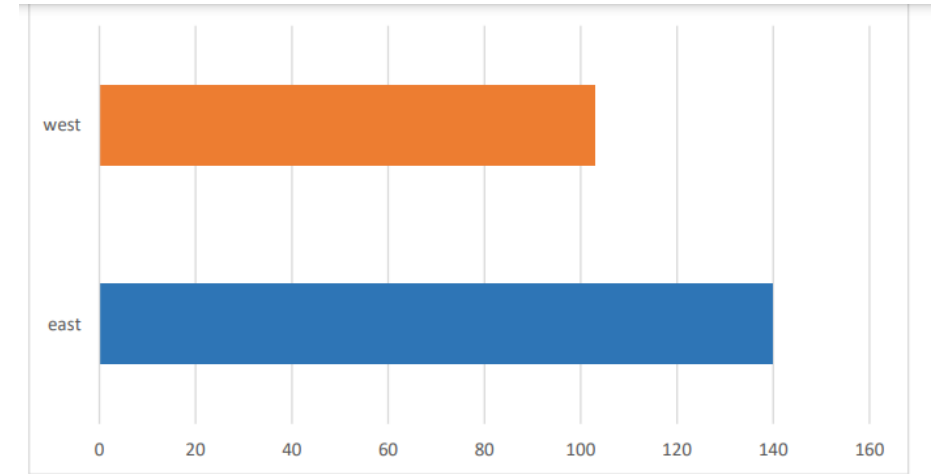
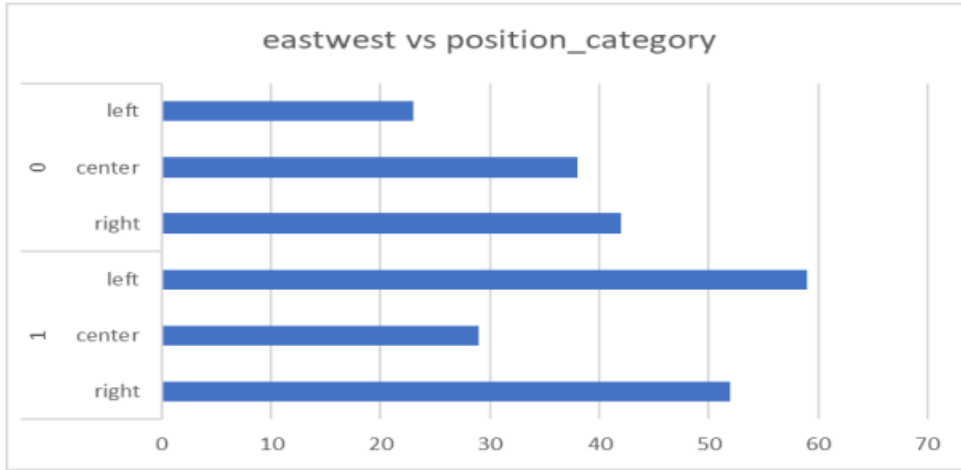
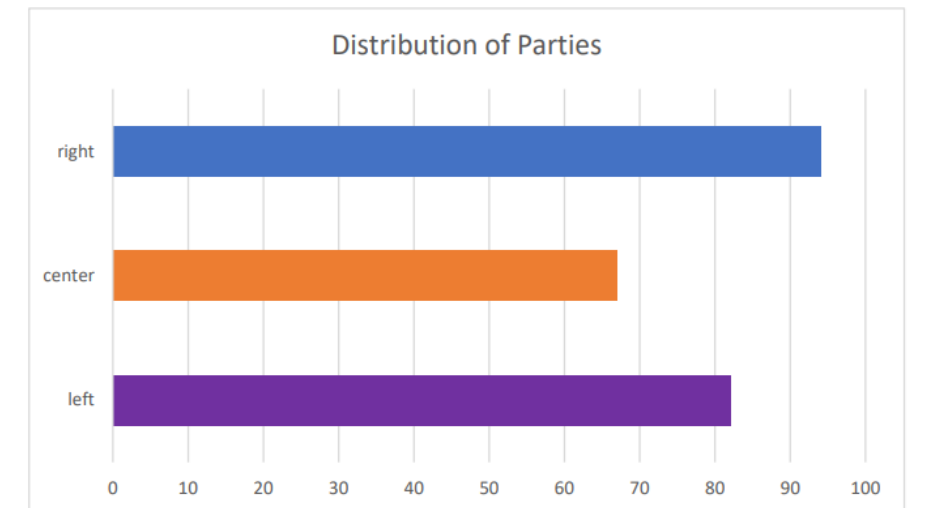
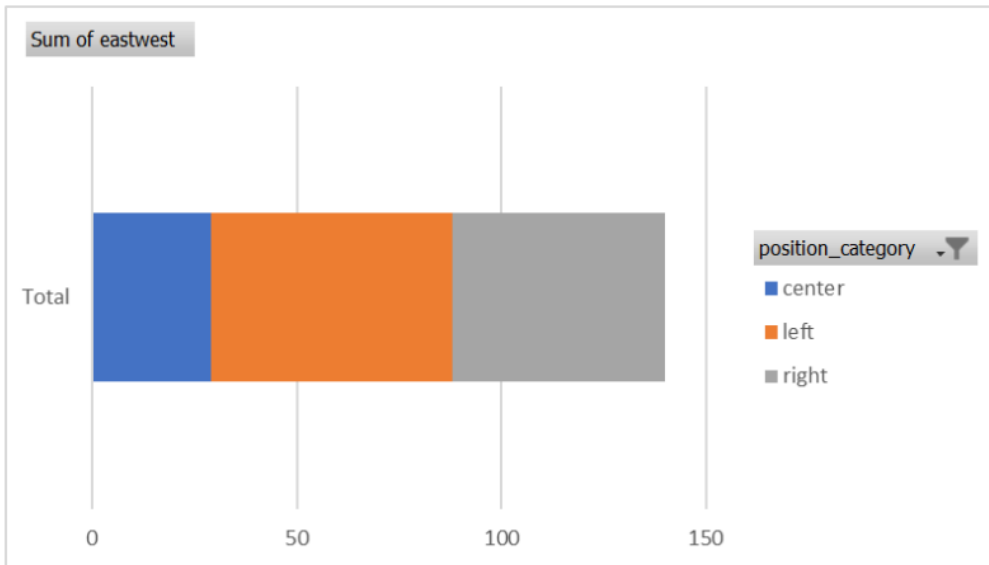


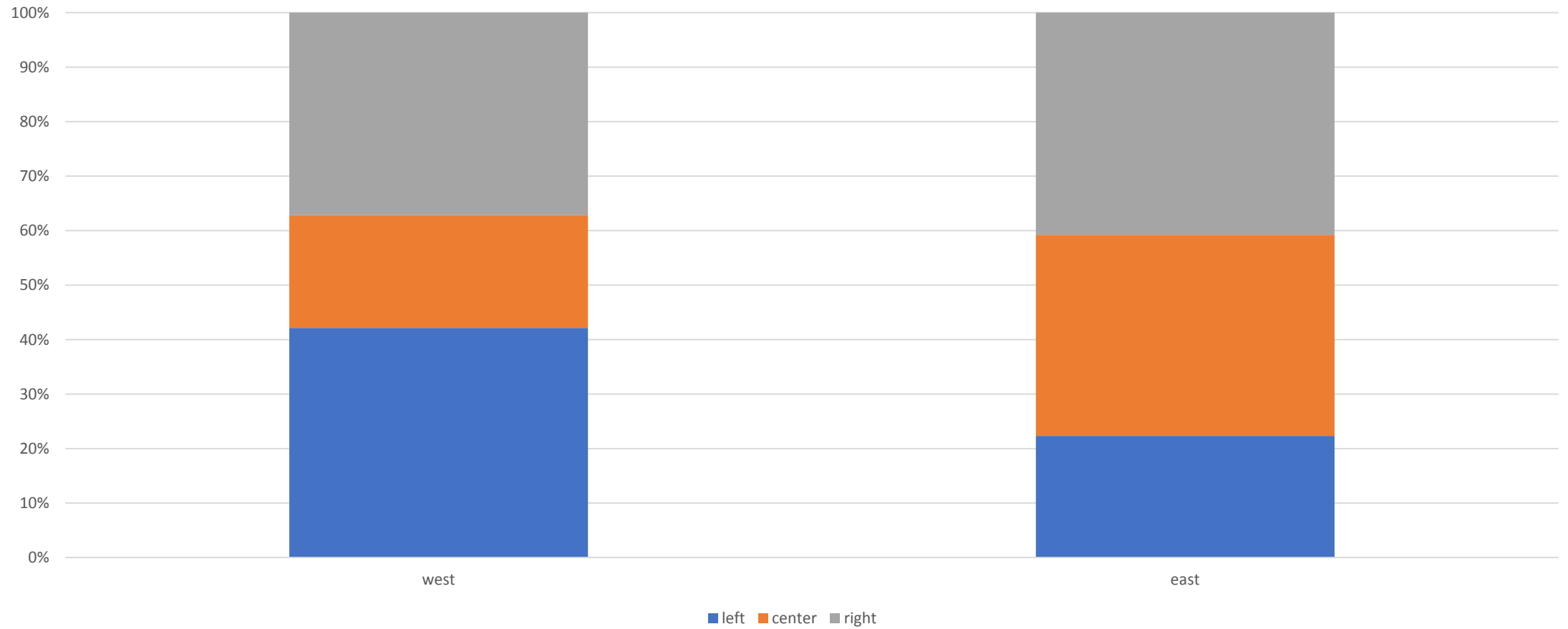
# Vizualization of Time Data

# relationship between European regions (variable eastwest) and distribution of parties on left-right axis



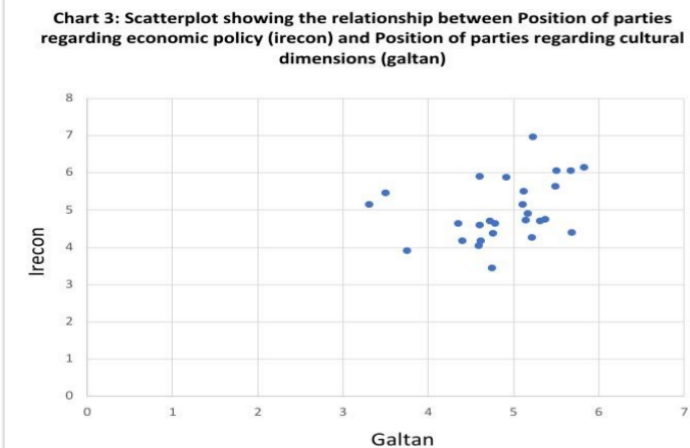
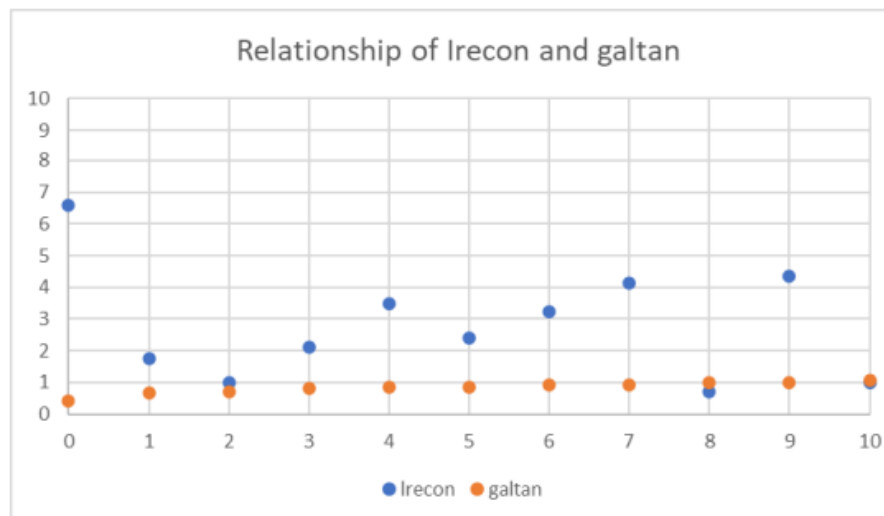
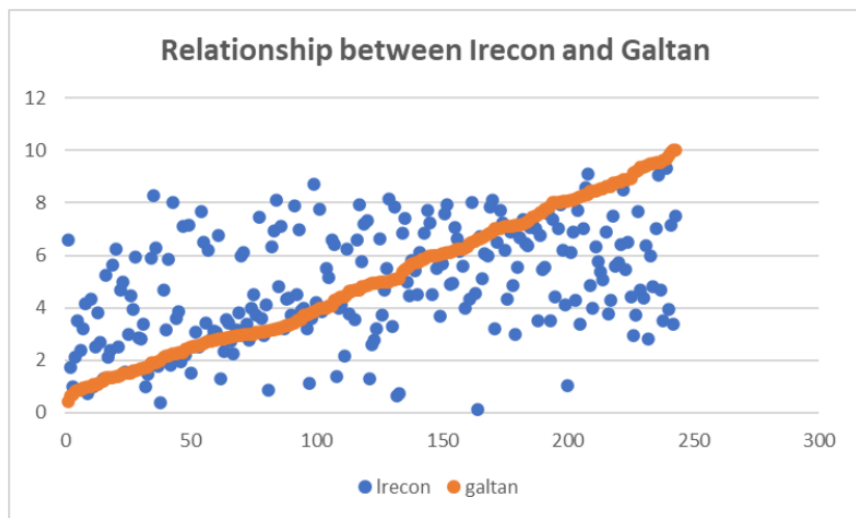
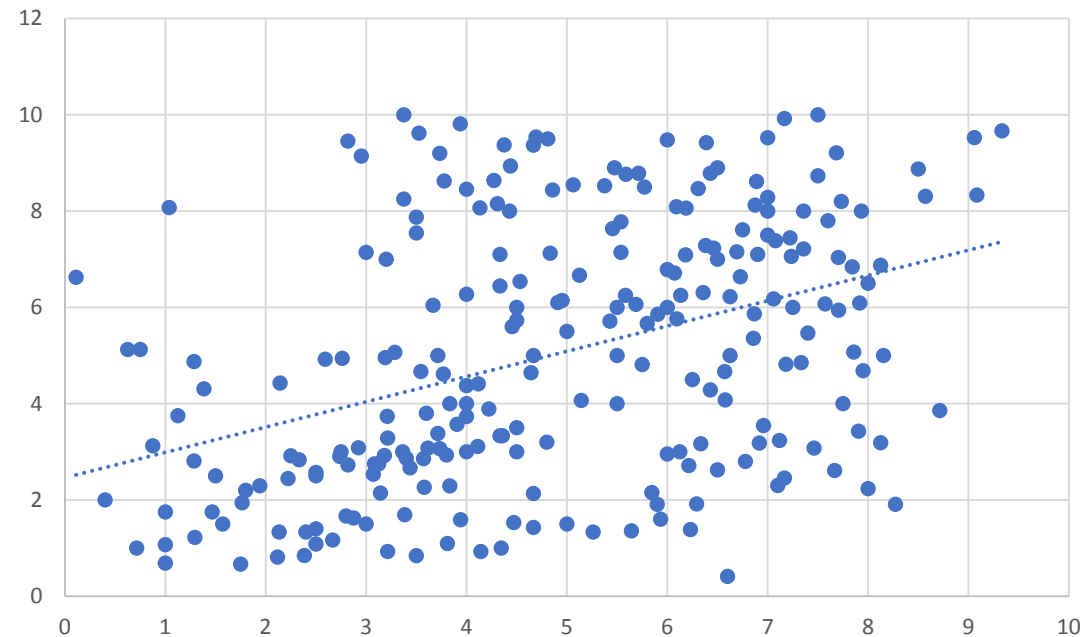
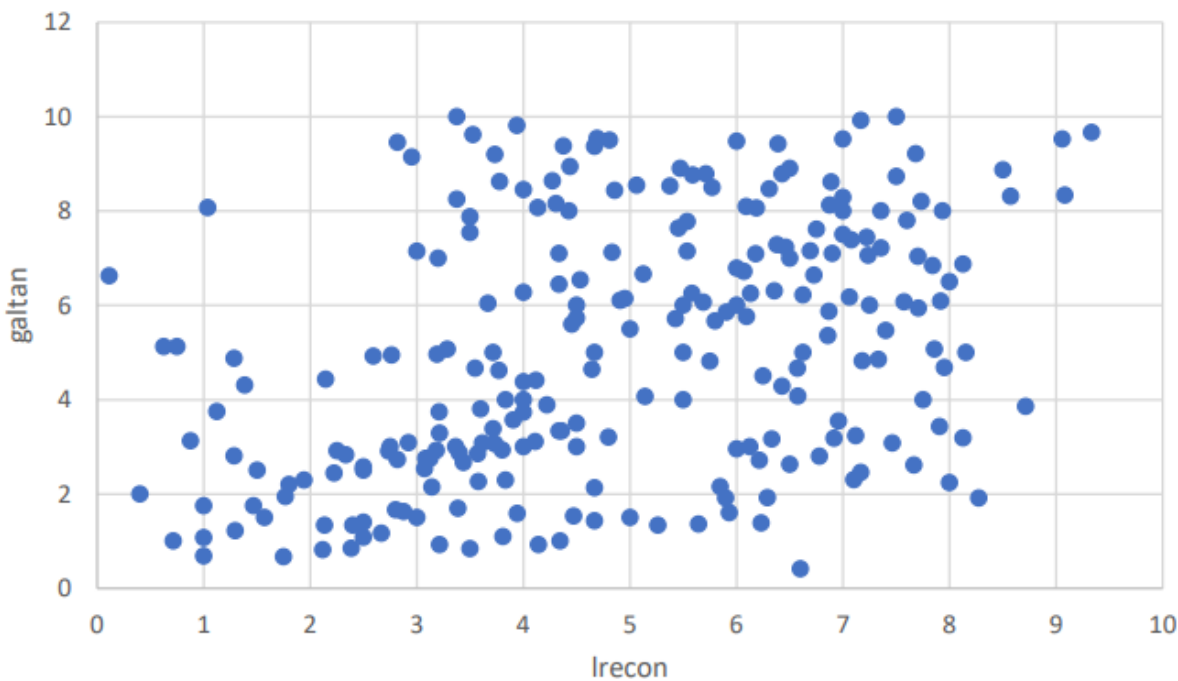
2. Distribution of parties on left-right axis (variable position\_category: left-center-right).

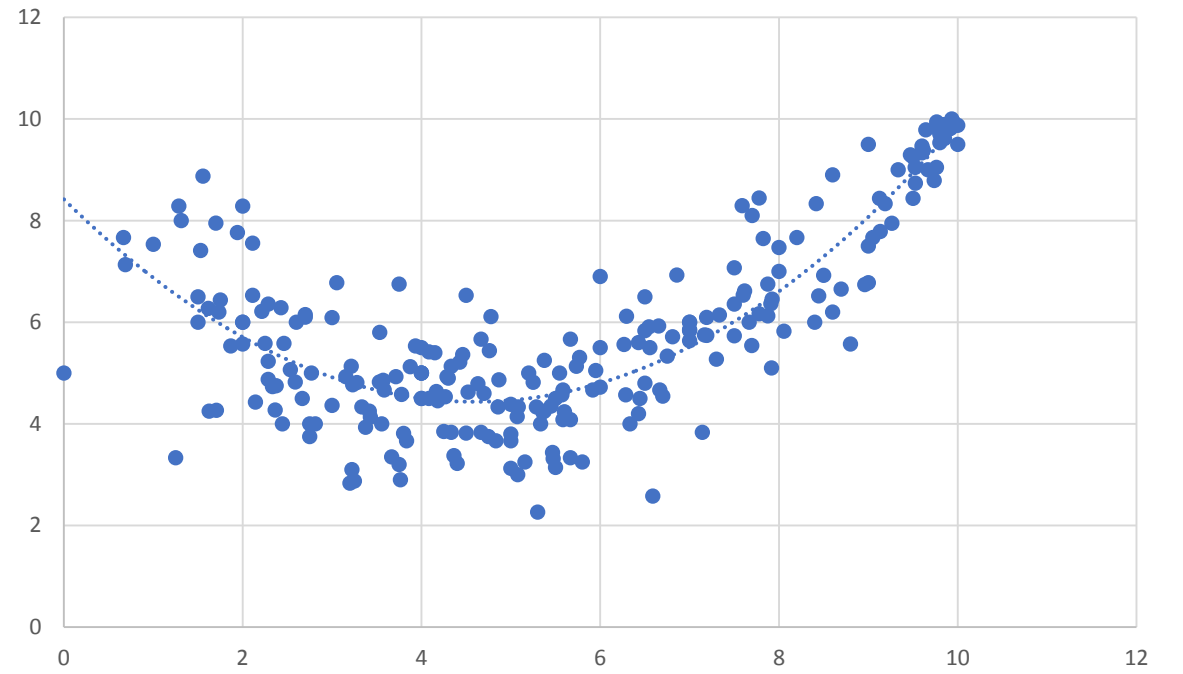
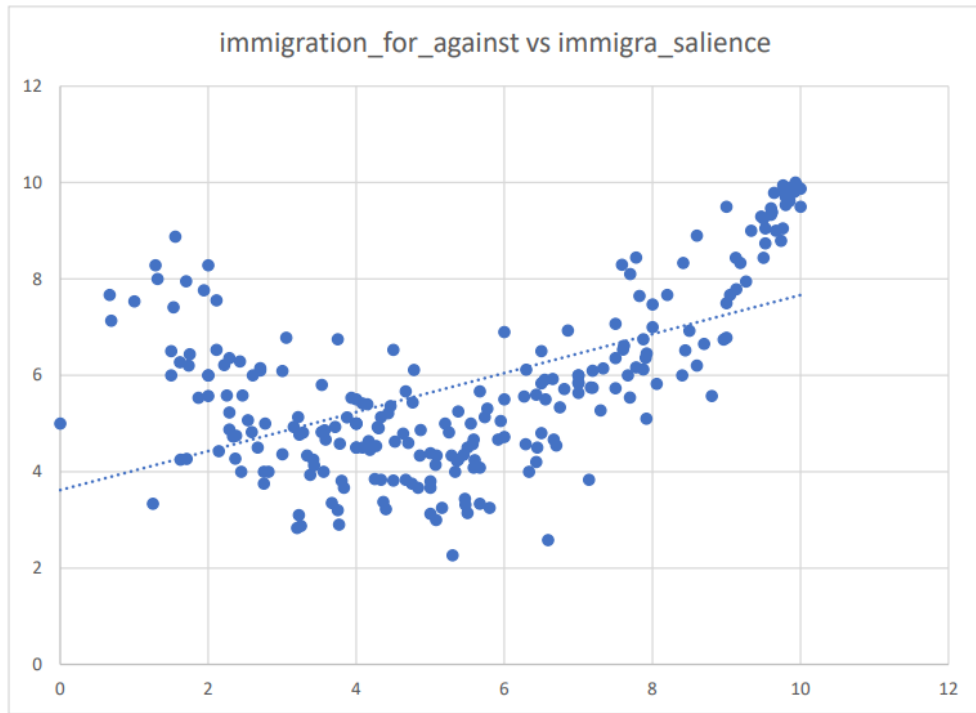


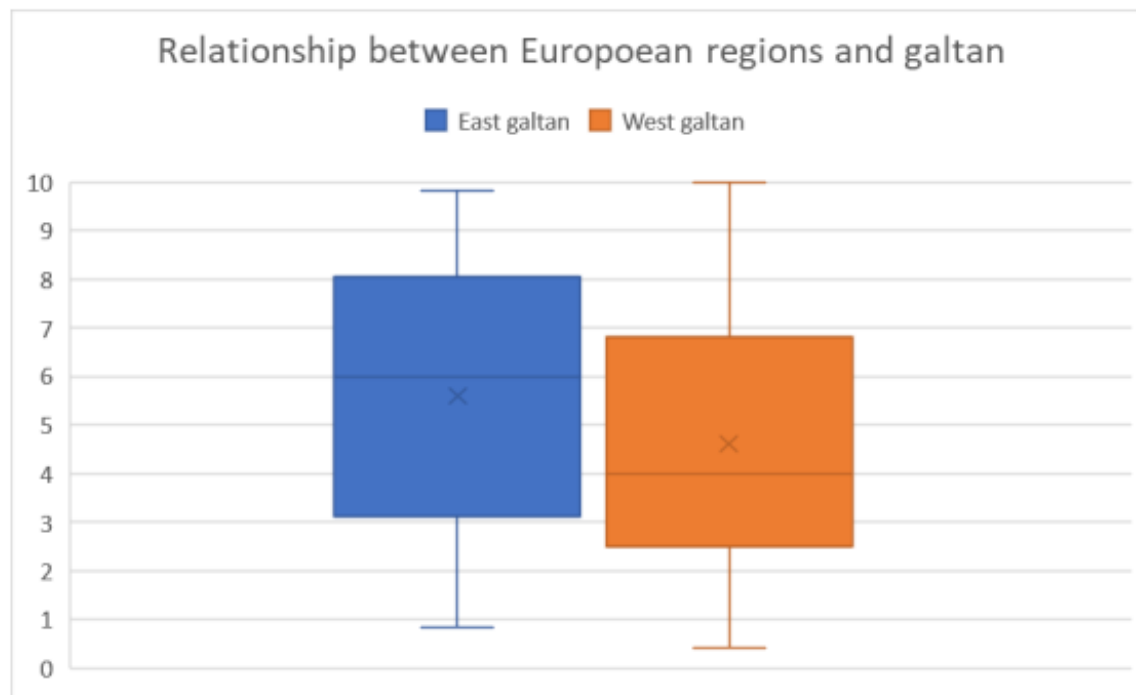
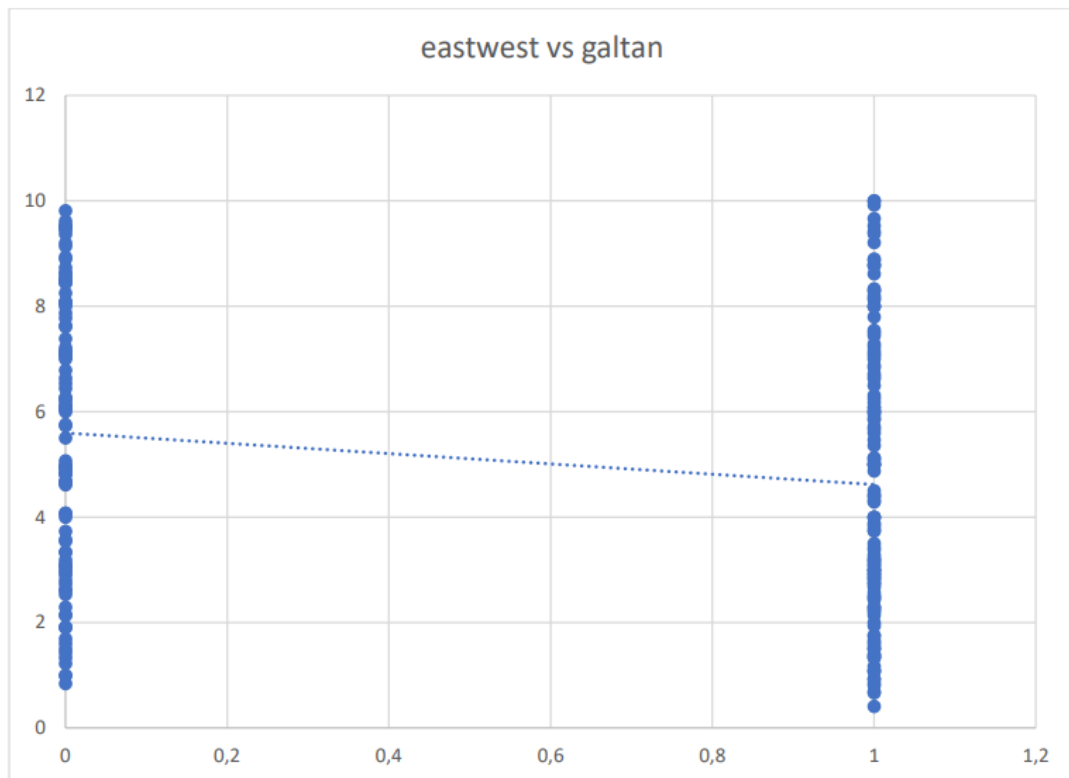


# Show the relationship between Irecon and galtan

Relationship between Irecon and galtan







- Continuity - temperature, party support
- Discontinuity – elections
  
- Data: Annually, monthly, daily, (hours, minutes, seconds)
  - Irregular: elections, exams, conflicts
  
- Easy to find spurious correlation

# Three elements of Time Data

- Trend – the overall direction of evolution
  - E.g. Global warming, increasing prices
- Seasonality – regular changes in data
  - Weather, unemployment, activity during day
- White noise



# Trend

- Usually the most important things
- Allows us to say what is happening
- Forecast (be cautious with that)
- The main source of spurious correlation

# Seasonality

- Usually the most annoying aspect of time data
- The solution is to look on the whole season
  - The detail is lost in such case

# White noise

- Important when we want to see impact of some event
- Make the general information hard to see
- Moving average – replace current value by average of neighbouring values
  - Usually 3, 5 or 7
  - Depends on data (e.g. Monthly temperature)

File Home **Insert** Page Layout Formulas Data Review View Automate Developer Help LightPDF Acrobat

PivotTable Recommended Table Pictures Shapes SmartArt Recommended Charts Maps PivotChart 3D  
PivotTables 3D Models Illustrations

year

A	B	C	D	E	F	G	H	I
	year	month	trust_gov	inflation	issue_tero	issue	unemployment	
	2009	2	26.9631	91.9	0	4.068117		
	2009	3	28.15534	91.9	0.176523	10.32657		

**2-D Line**

The screenshot shows the Microsoft Excel interface with the 'Insert' tab selected. Below the ribbon, a data table is visible with columns for 'year', 'month', 'trust\_gov', 'inflation', 'issue\_tero', and 'issue unemployment'. The '2-D Line' chart options menu is open, showing several line chart styles. Two of these styles are circled in red.

File Home Insert Page Layout Formulas Data Review View Automate Developer Help LightPDF Acrobat **Chart Design** Format

Add Chart Quick Element Layout Change Colors

Chart Layouts Chart Styles

Switch Row/Column Select Data Change Chart Type Move Chart

Data Type Location

C1 fx 17.4

year	month	temperatu	normal	year average
1999	I.	-1.3	-2	8.35
1999	II.	3.4	-0.9	8.35
1999	III.	4.1	2.9	8.35
1999	IV.	7.5	7.9	8.35
1999	V.	15.4	13	8.35
1999	VI.	17.4	15.8	8.35
1999	VII.	18.5	17.8	8.35
1999	VIII.	18.5	17.3	8.35
1999	IX.	11.8	12.8	8.35
1999	X.	6.8	8.1	8.35
1999	XI.	4.7	2.9	8.35
1999	XII.	-2.8	-0.9	8.35
2000	I.	-2.4	-2	9.108333
2000	II.	-4.4	-0.9	9.108333
2000	III.	3.5	2.9	9.108333
2000	IV.	7.1	7.9	9.108333
2000	V.	15	13	9.108333

Select Data Source

Chart data range: =line!\$A\$1:\$A\$289;line!\$C\$1:\$E\$289

Switch Row/Column

Legend Entries (Series)






- year
- temperature
- normal
- year average

Hidden and Empty Cells

OK Cancel

### Format Axis

Axis Options **▼** Text Options

> **Axis Options**

> **Tick Marks**

▼ **Labels**

Interval between labels

Automatic

Specify interval unit

Distance from axis

Label Position  ▼

Multi-level Category Labels

> **Number**

**Add Chart Element** | **Quick Layout** | **Change Colors**

- Axes
- Axis Titles
- Chart Title
- Data Labels
- Data Table
- Error Bars
- Gridlines
- Legend
- Lines
- Trendline**
- Up/Down Bars

**More Trendline Options...**

	C	D	E
temperatu	normal	year average	
	-1.3	-2	8.35
	3.4	-0.9	8.35
	4.1	2.9	8.35
	7.5	7.9	8.35
	15.4	13	8.35
	17.4	15.8	8.35
	18.5	17.8	8.35
	18.5	17.3	8.35
	11.8	12.8	8.35

**2000 I.**  
**2000 II.**  
**2000 III.**  
**2000 IV.**  
**2000 V.**  
**2000 VI.**  
**2000 VII.**  
**2000 VIII.**  
**2000 IX.**

**None**  
**Linear**  
**Linear Forecast**  
**Moving Average**

### Format Trendline

**Trendline Options**

- Exponential
- Linear
- Logarithmic
- Polynomial Order 2
- Power
- Moving Average** Period 2

**Trendline Name**

- Automatic** 2 per. Mov. Avg. (normal)
- Custom

**Forecast**

**Forward**  per

**Backward**  per

**Set Intercept**

Chart Styles

Chart Styles: Five thumbnails showing different visual styles for a line chart.

Data: Switch Row/Column, Select Data

Type: **Change Chart Type** (circled in red)

Location: Move Chart

H Change Chart Type ? X

Recommended Charts All Charts

- Recent
- Templates
- Column
- Line
- Pie
- Bar
- Area
- XY (Scatter)** (circled in red)
- Map
- Stock
- Surface
- Radar
- Treemap
- Sunburst
- Histogram
- Box & Whisker
- Waterfall
- Funnel
- Combo

Line

Chart Title

month

year

temperature normal

year average 2 per. Mov. Avg. (normal)