Wage Gap Global

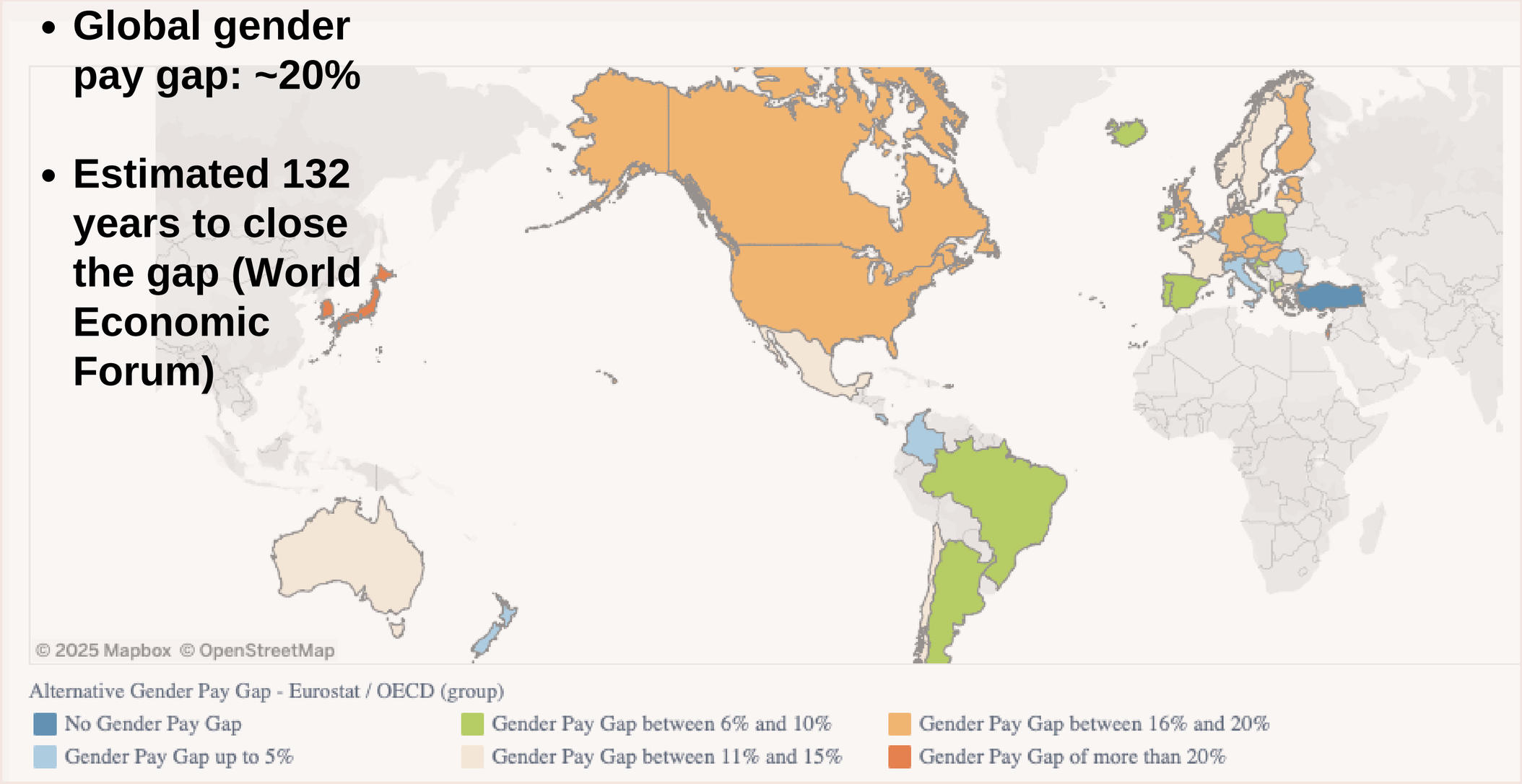
An Analytical Perspective on Gender Pay Disparities

Bootcamp Final Project - Data Analytics

Velia Alaminos - sept 2025

The Problem: Global Context

- **Global gender pay gap: ~20%**
- **Estimated 132 years to close the gap (World Economic Forum)**



Research question:

How has the gender wage gap evolved (2013–2023) across countries with different HDI levels — and when could equality be reached?

Data Collection

Sources

- Human Development Reports.
- International Labour Organization.
- World Bank Dataset.

Period:

2013 - 2023

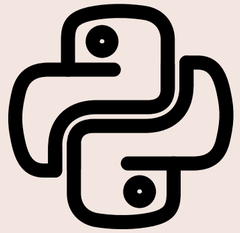
Result:

Rows: 440,000 +
Key fields: continent, country, year, gender, indicator (*'Employment', 'Average Hourly Earnings'*), age_group, education_level, value_usd, HDI_2023

```
Final shape of df_merged_clean: (443193, 19)
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 443193 entries, 0 to 443192
Data columns (total 19 columns):
 #   Column           Non-Null Count   Dtype
---  ------           --------------   -----
 0   category         443193 non-null  object
 1   continent        443193 non-null  object
 2   ISO_A            443193 non-null  object
 3   country          443193 non-null  object
 4   year             443193 non-null  int64
 5   indicator        443193 non-null  object
 6   gender           442993 non-null  object
 7   classif_type1    443193 non-null  object
 8   classif_type2    295921 non-null  object
 9   value            443193 non-null  float64
 10  HDI_2023         443193 non-null  float64
 11  age_group        425826 non-null  category
 12  education_level  443193 non-null  object
 13  unit             443193 non-null  object
 14  value_usd        443193 non-null  float64
 15  scale            443193 non-null  object
 16  population       379625 non-null  float64
 17  indicator_abbr   443193 non-null  object
 18  indicator_group  443193 non-null  object
dtypes: category(1), float64(4), int64(1), object(13)
memory usage: 61.3+ MB
```

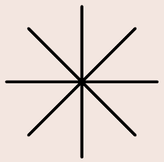
Data Processing

Python: wrangling, cleaning & USD conversion of Raw ILOSTAT CSVs, Population & Local Currency datasets



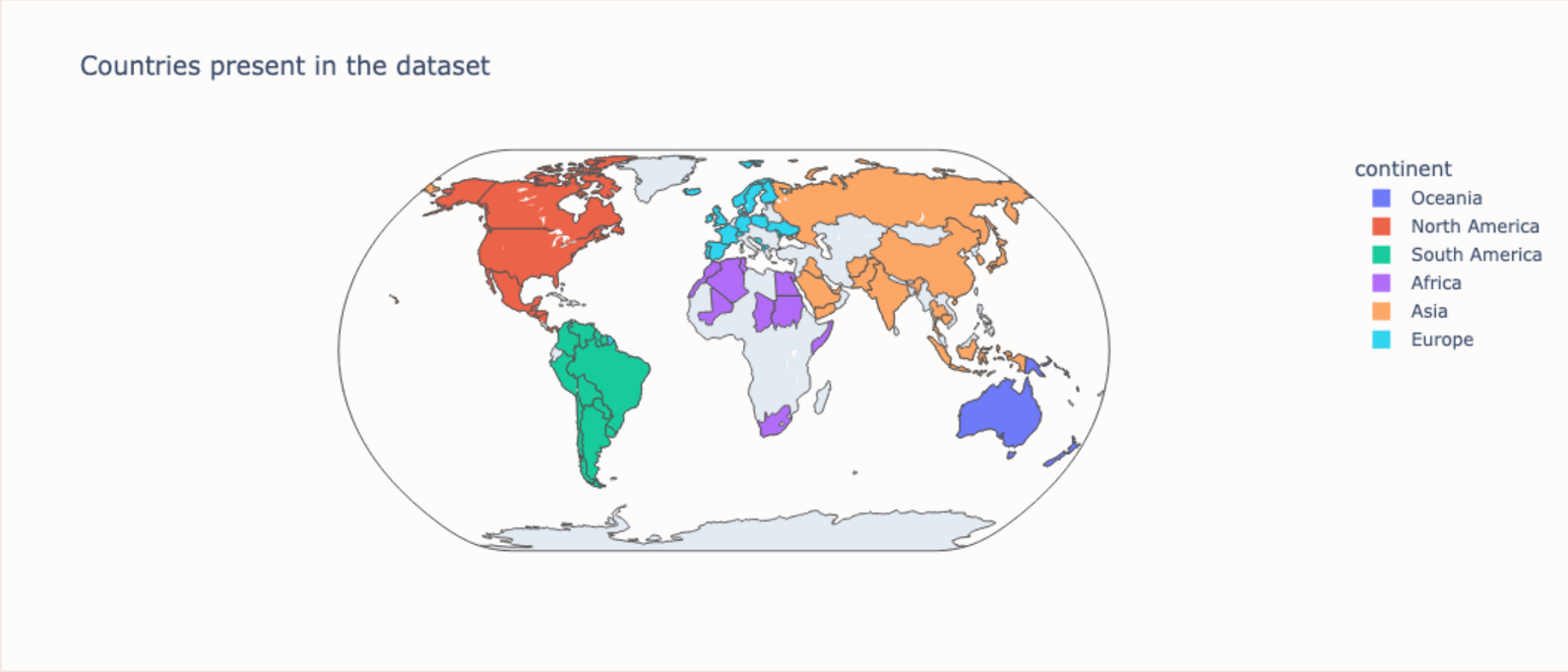
SQL: normalized tables in MySQL for efficient queries

Tableau: dashboards for exploratory analysis and presentation

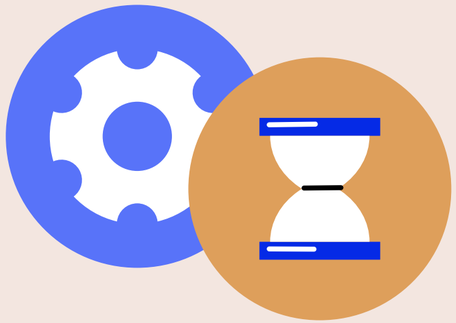


Analysis Approach

- **Top 5 HDI** countries per continent.
- **Bottom 5 HDI** countries per continent.
- **Plus strategic country** picks for regional context.
- Comparisons by **age, education level** and **indicator type** (wage, hourly, labour participation).

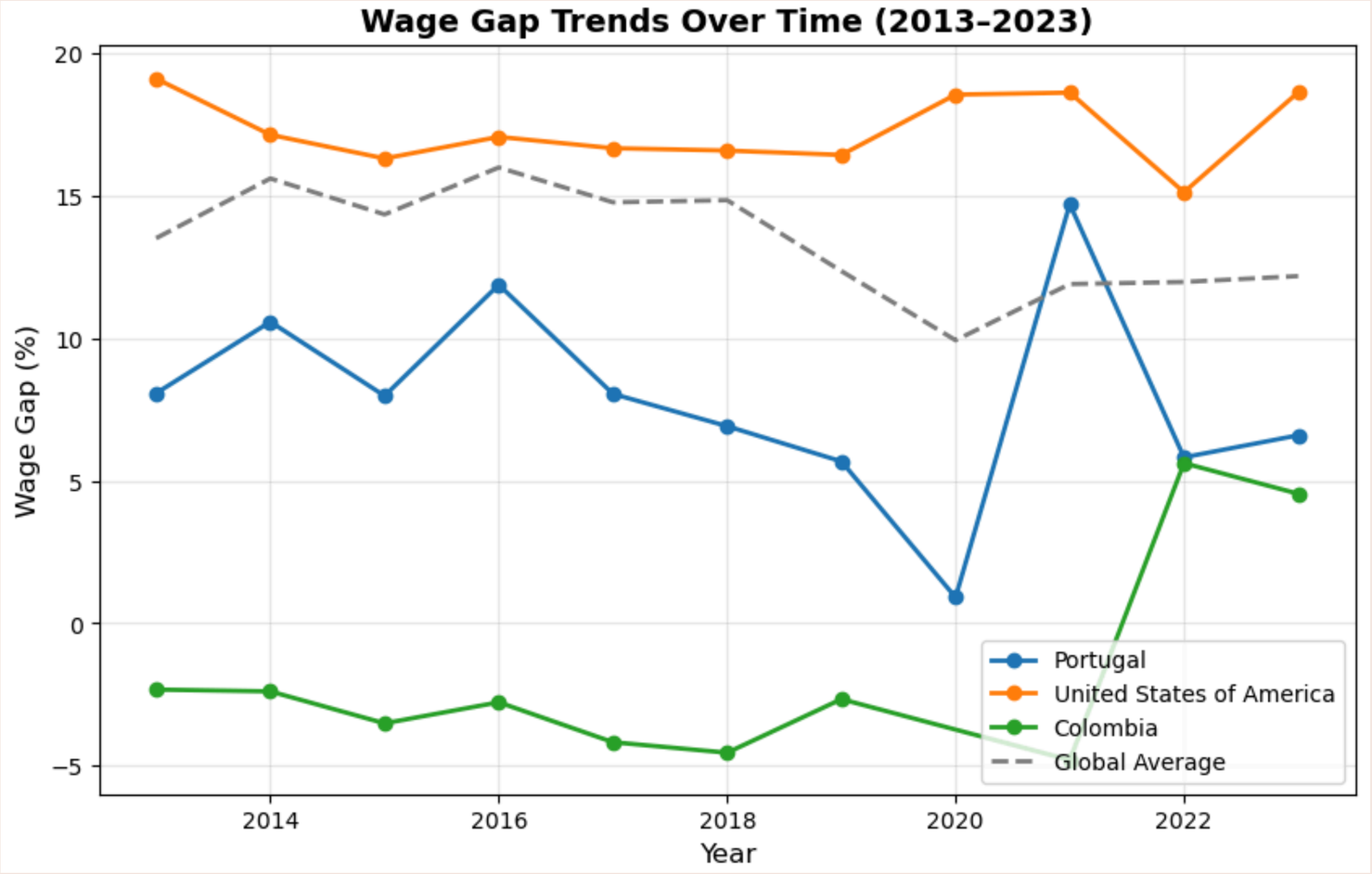


Key Insights: Global Comparison



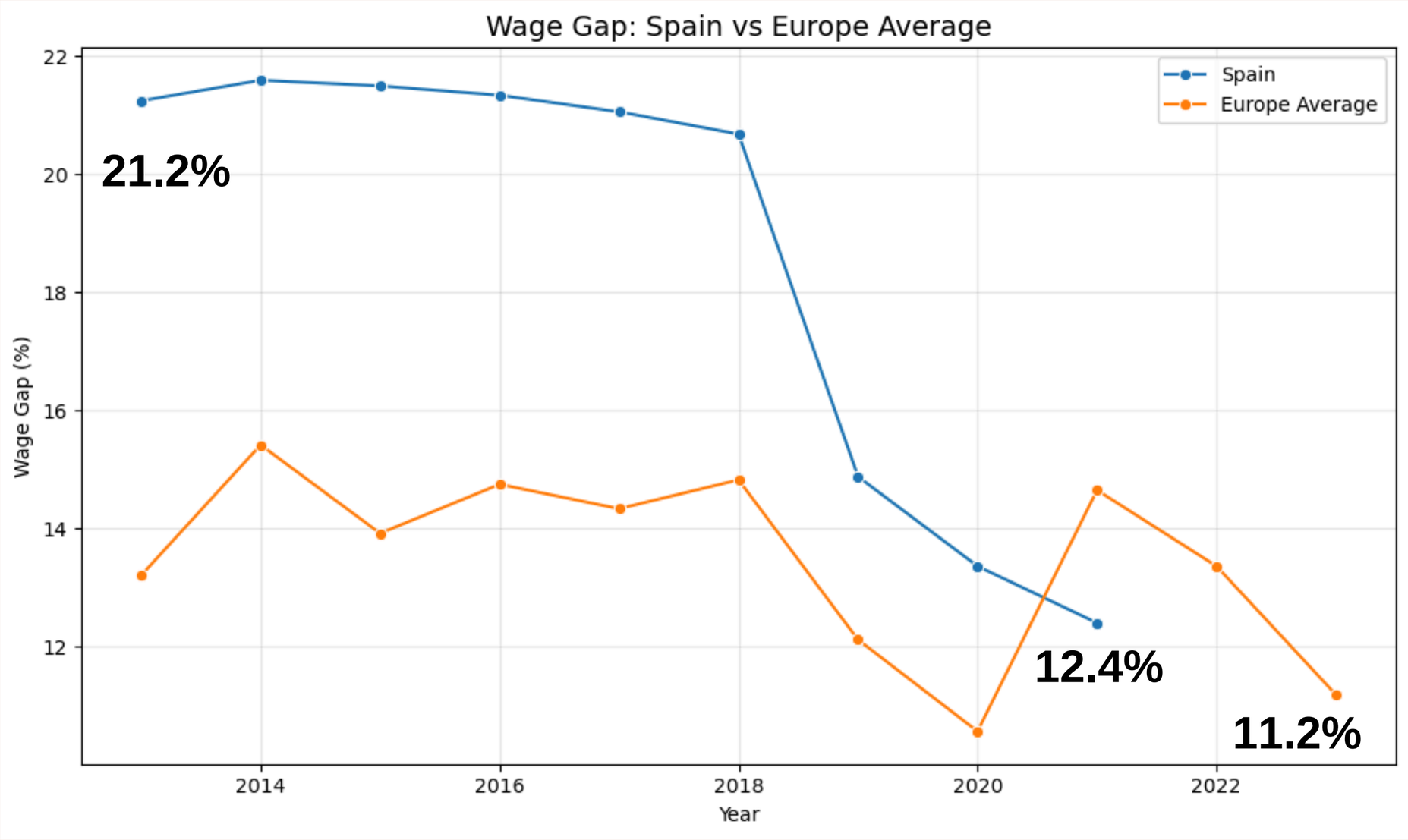
https://public.tableau.com/app/profile/velia.alaminos/viz/WageGapGlobal/WageGapGlobal

Key Insights: Global Wage Gap Trends Over Time



- Progress is slow and inconsistent
- Some countries show steady improvement
- Others remain stagnant or volatile

Case Study: Spain vs Europe

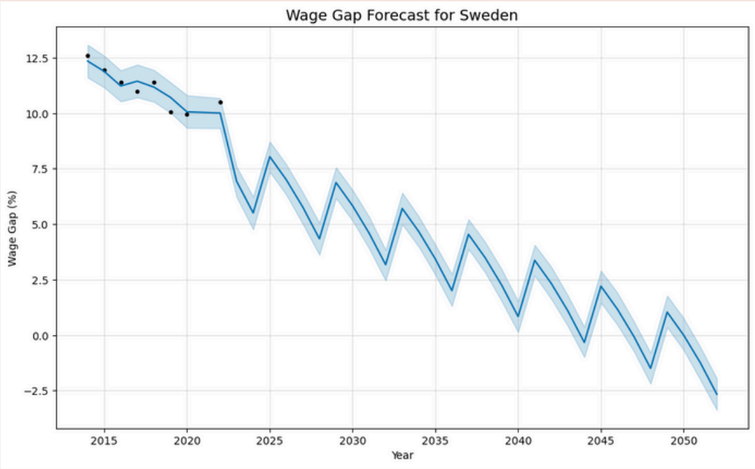


Forecasting: method & scope

- Model types considered: linear trend and time-series (Prophet)
- Target: year when predicted gap ≤ 0.0 (parity) per country
- Note: we’ll present example forecasts and uncertainty intervals

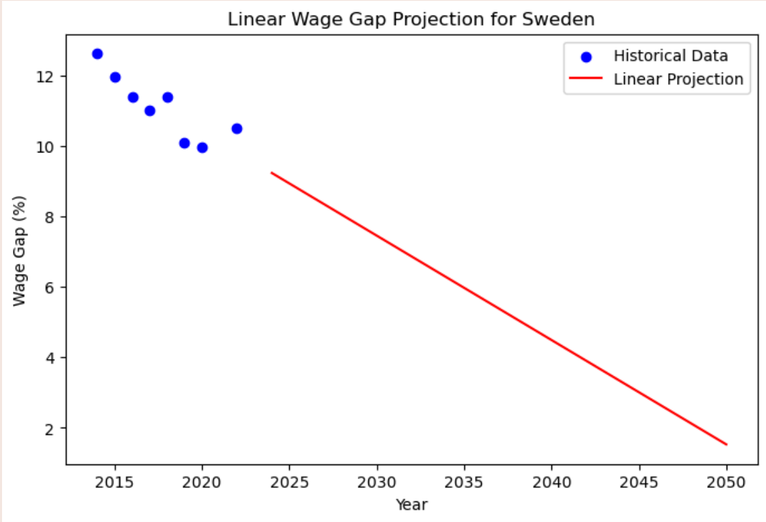
Forecasting Wage Parity — Sweden vs Chile

Sweden (30 years)



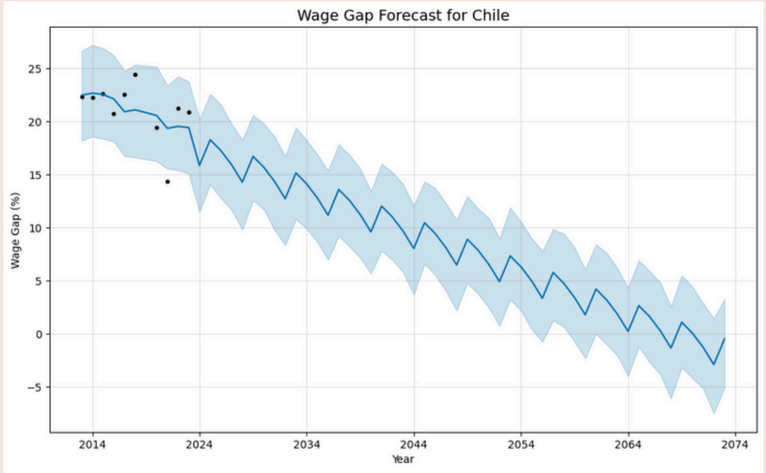
Methods: *Prophet (95% CI) & Linear baseline*

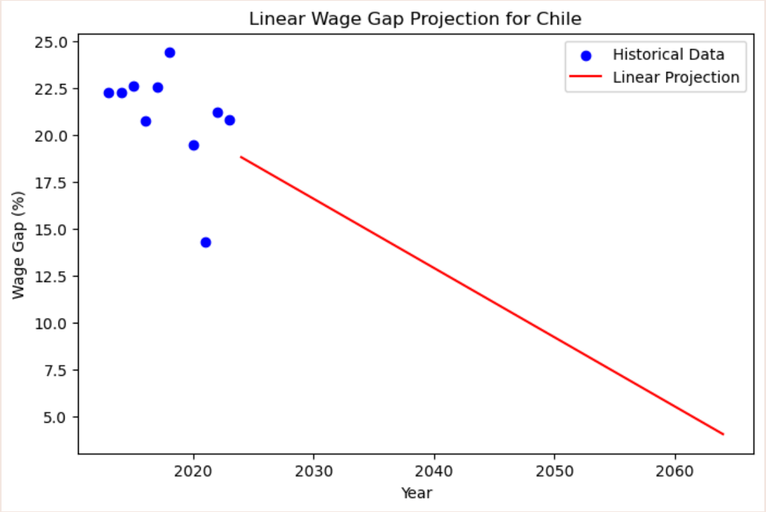
Chile trends not statistically significant (p = 0,17) - interpret results with caution



Sweden parity (linear) ≈ 2055
Chile parity (linear) ≈ 2075

Chile (50 years)





Conclusions

Key takeaways

- The gender wage gap is global and persistent; development level alone doesn’t ensure parity.
- Patterns vary by age and education — targeted policies can help.
- Forecasts show parity is decades away in many countries unless the pace accelerates.

Closing & Call to Action

Behind every
percentage point,
there are real lives and
opportunities.
Let's make sure future
generations don't have
to fight for what
should already be
theirs.

Thanks!

Do you have any questions?

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