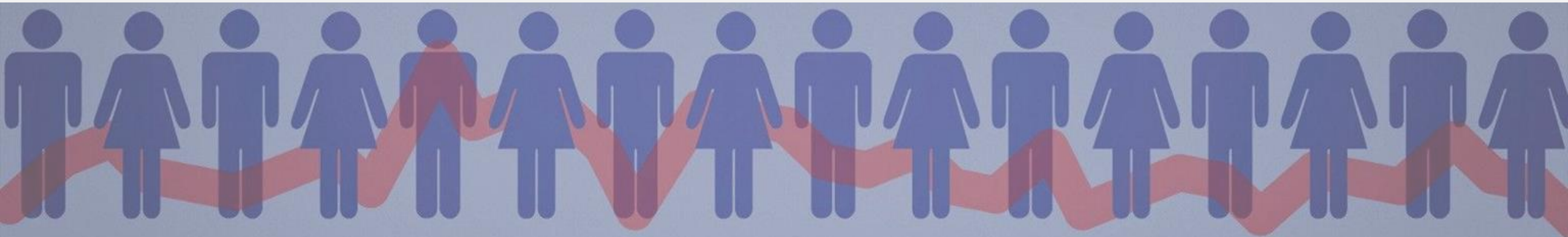




# Unraveling the Challenges of Unemployment in Africa: *A Data-Driven Approach*

Orinamhe Godwin Agbadua



# Overview

Unemployment is a multifaceted problem impacting individuals and communities globally, with deep roots in socio-economic, educational, and policy-related factors.

Tackling unemployment requires coordinated efforts through several factors. Some key factors are:

Education and skill levels

Infrastructure

Government policies

Economic vitality – health of private sector.

Unemployment in Africa presents a unique and pressing challenge, as the continent grapples with rapid population growth, limited industrialization, and economic disparities.

# Objectives

This study aimed to analyze data, identify patterns, and propose informed, data-driven recommendations that governments and stakeholders can implement to effectively address and reduce unemployment rates in Africa.

This was divided into several objectives:

1. Understand the multi-dimensional nature of unemployment in Africa.
2. Identify key factors contributing to high unemployment rates.
3. Propose data-driven solutions and strategies

# The Dataset

- 1. Unemployment Rate (Men vs. Women):** provides a comparative view of unemployment rates.
- 2. National Strategy for Youth Employment:** outlines various national strategies adopted across different African countries to combat youth unemployment.
- 3. Share of Education in Government Expenditure:** sheds light on how much governments are investing in education.
- 4. Population with Access to Electricity:** provides insights into the availability of electricity across different regions and its potential impact on employment.
- 5. Total Firms (Historical Data):** includes historical data on the number of firms.
- 6. Country Codes:** essential for mapping data points to countries, enabling a more precise and geographically contextual analysis.

# Data cleaning & validation

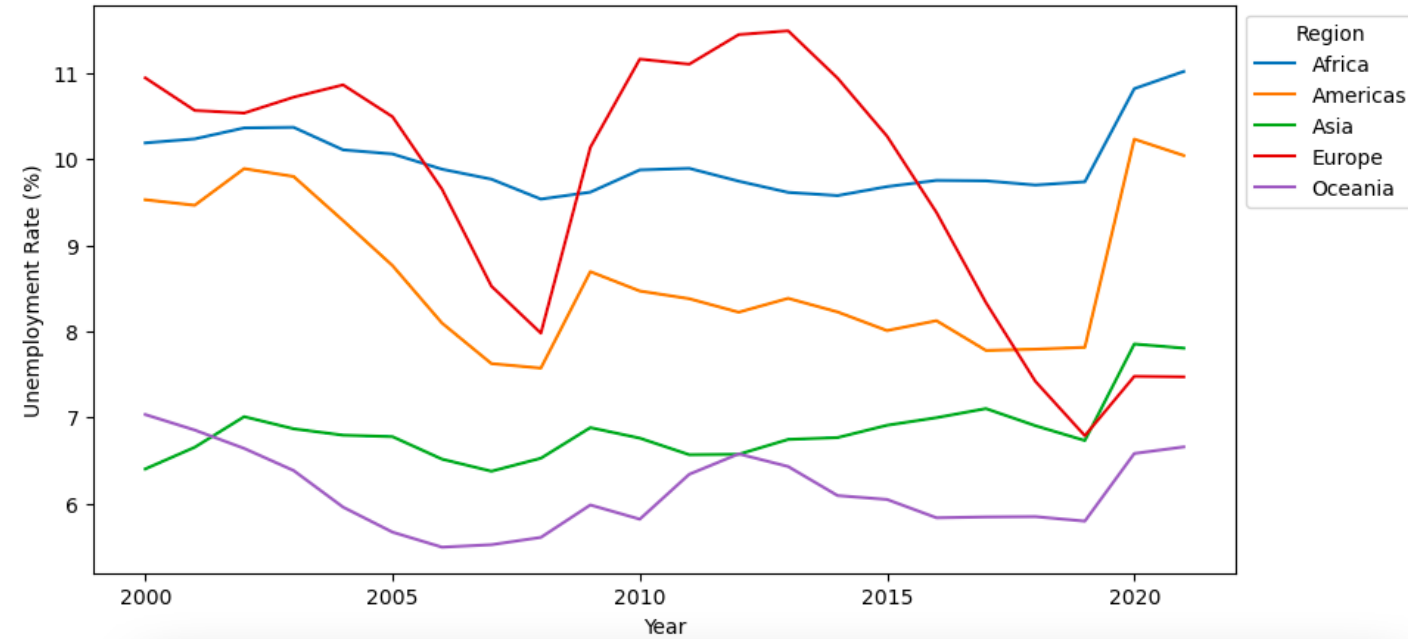
Data cleaning was conducted using Python, with step-by-step code development and detailed documentation carried out in Jupyter Notebook: [https://github.com/Orinamhe/Unravelling-unemployment-in-Africa/blob/main/Unravelling\\_unemployment\\_in\\_Africa.ipynb](https://github.com/Orinamhe/Unravelling-unemployment-in-Africa/blob/main/Unravelling_unemployment_in_Africa.ipynb)

The analysis was confined to data from the year 2000 onward to ensure that insights were drawn from current unemployment trends and their influencing factors.

This approach aimed to enhance the relevance and applicability of the findings.

# Unemployment rates across the world: female & male

Unemployment Rate Trends Across Regions Over Years



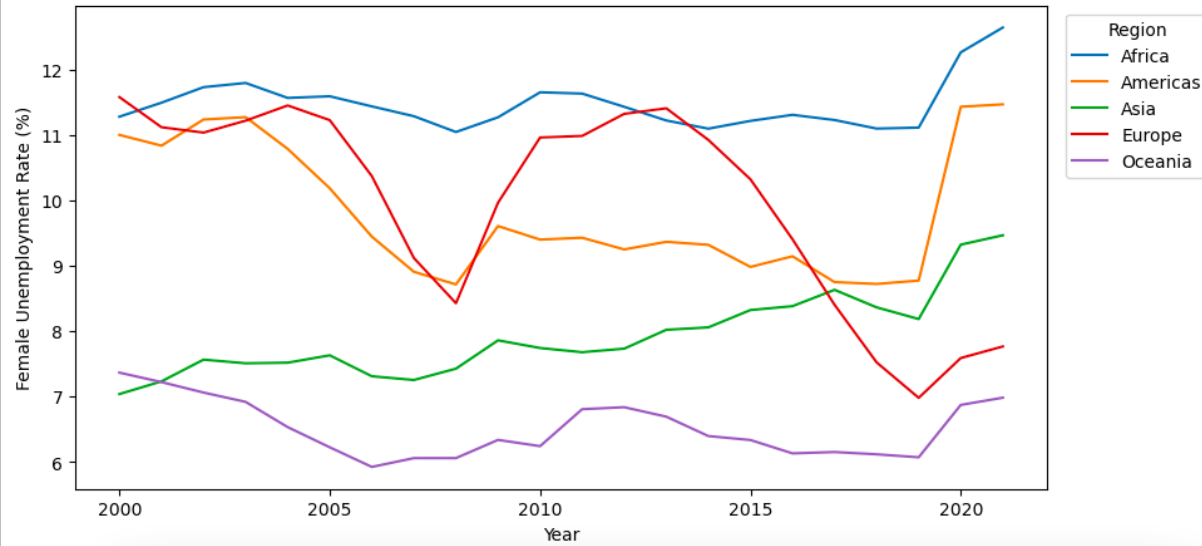
Africa currently has the highest unemployment rate among all regions.

Oceania has the lowest, then Europe.

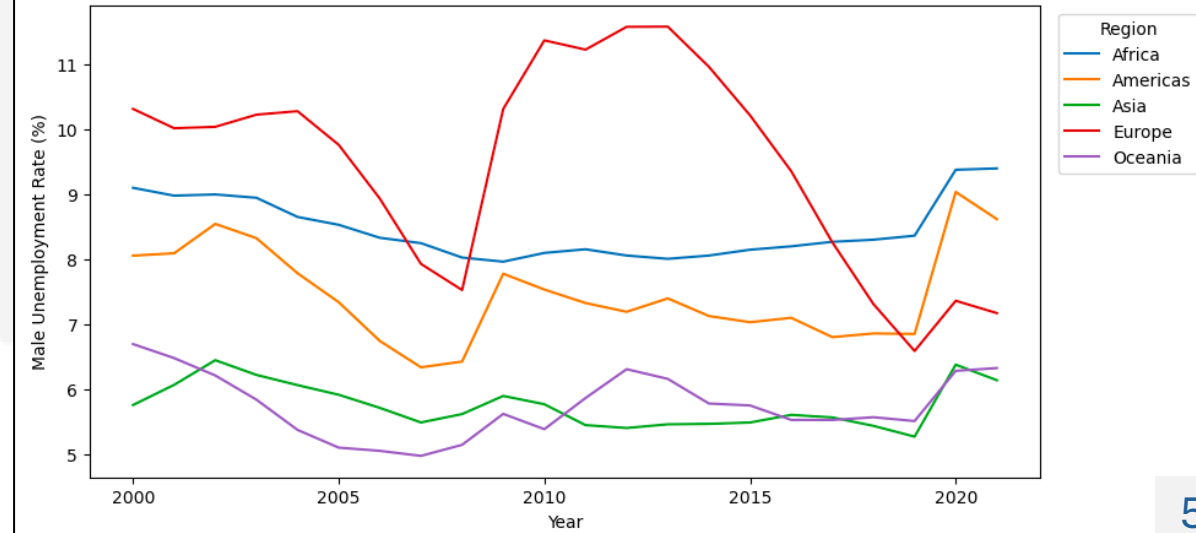
Female unemployment rate is higher than that of males in each region.

Europe serves as a good “regional” benchmark

Female unemployment rate trends across regions over years

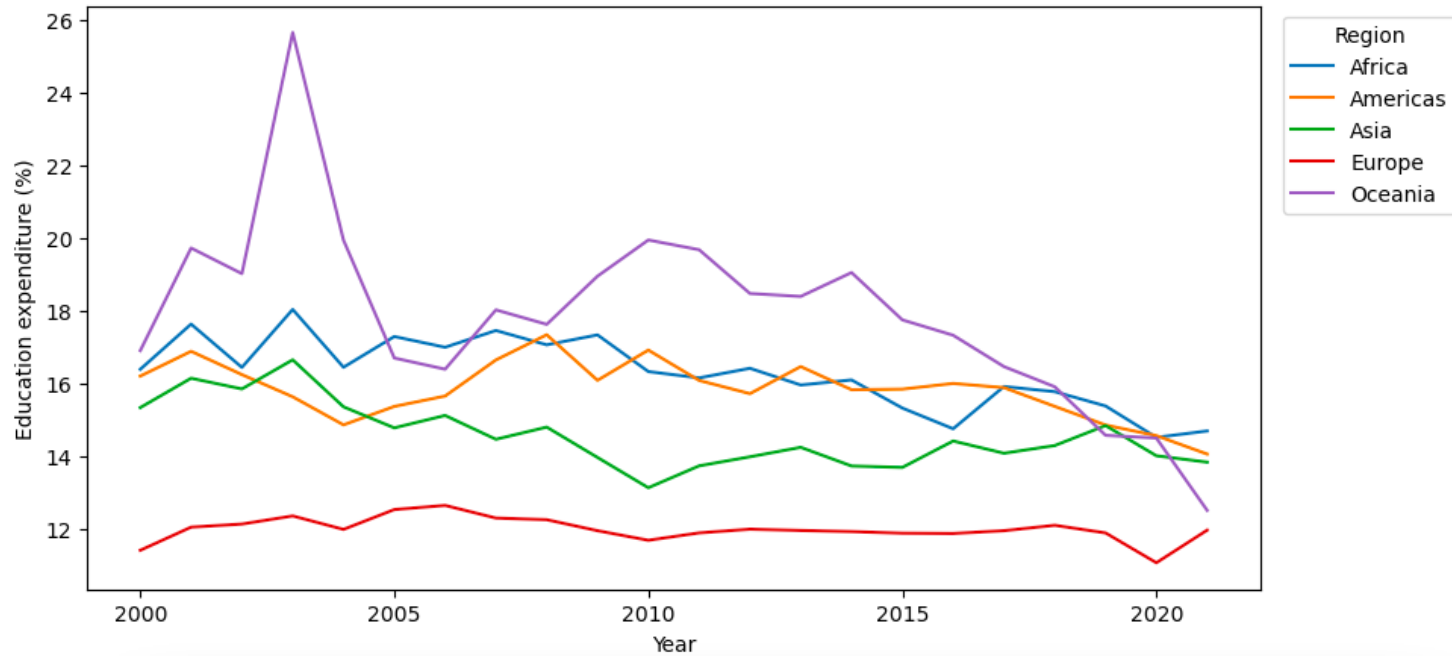


Male unemployment rate trends across regions over years



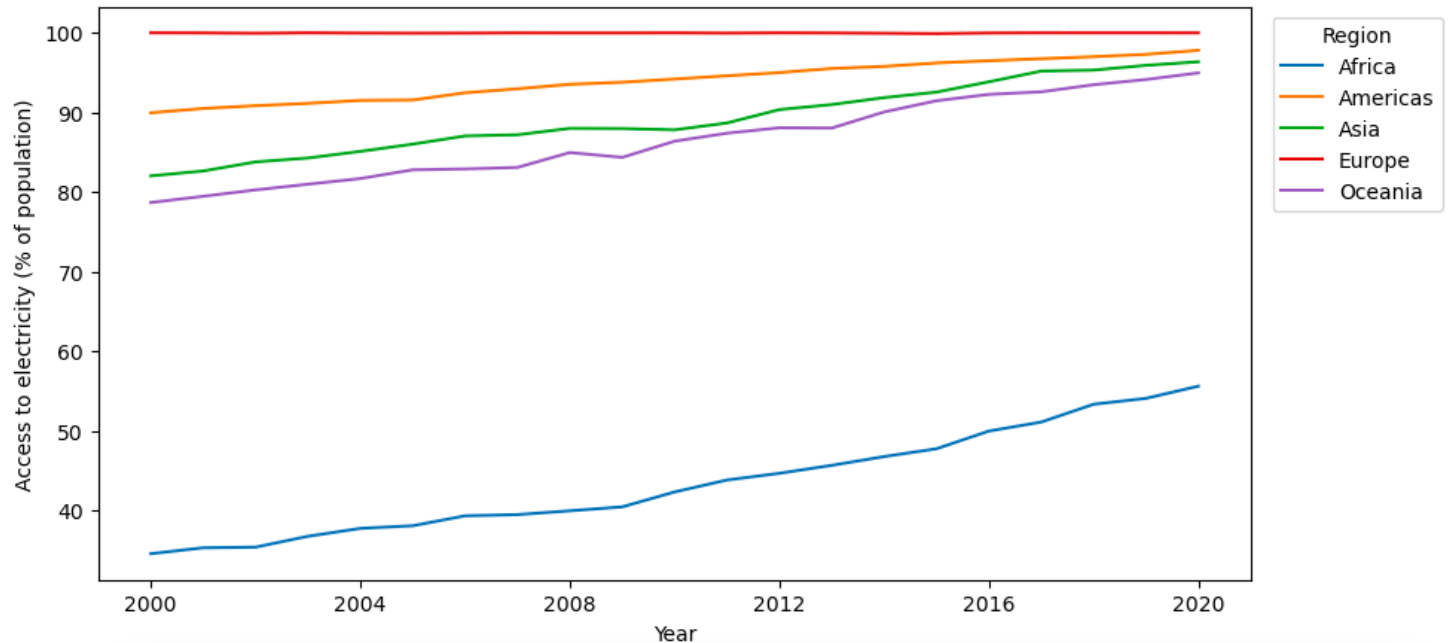
# Education & Electricity in each region

Government expenditure on education across regions over years



A slight decline in the government's expenditure on education in each region. Europe consistently had the lowest education expenditure of all regions since 2000.

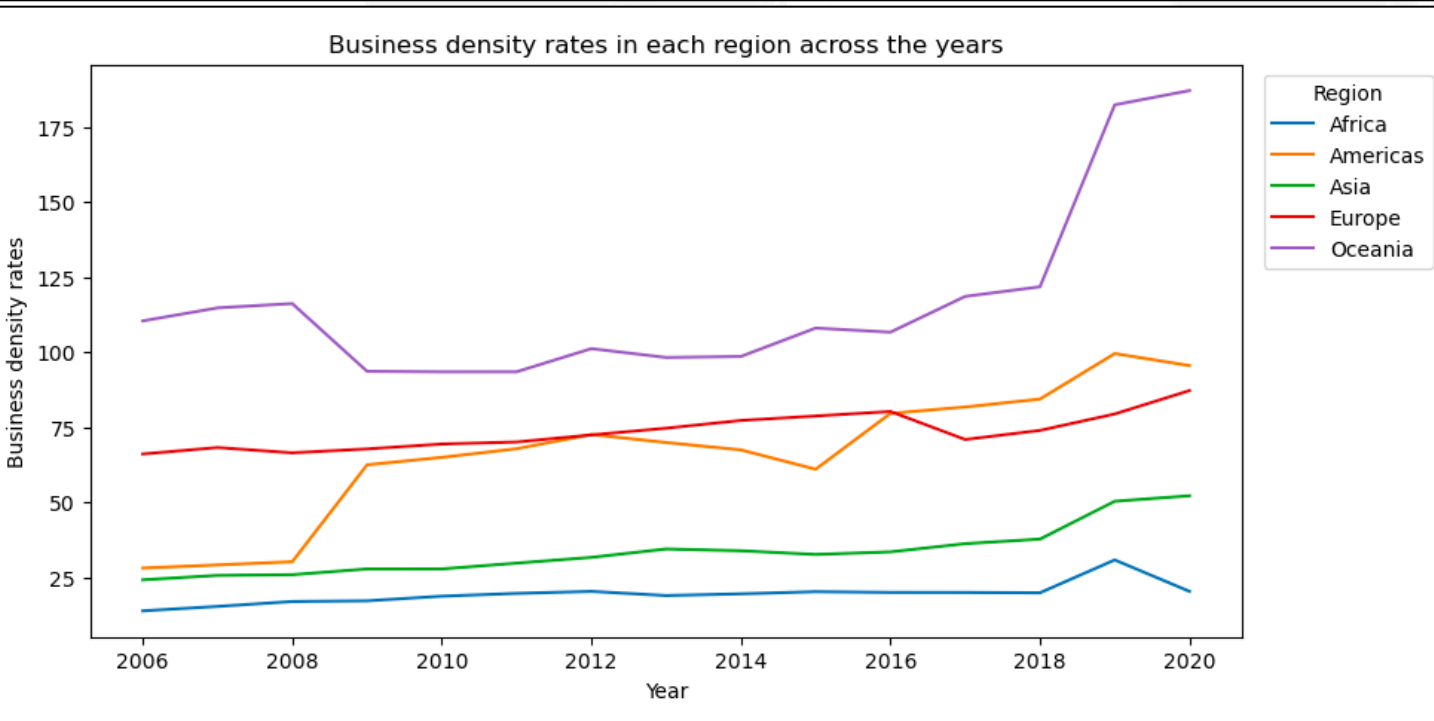
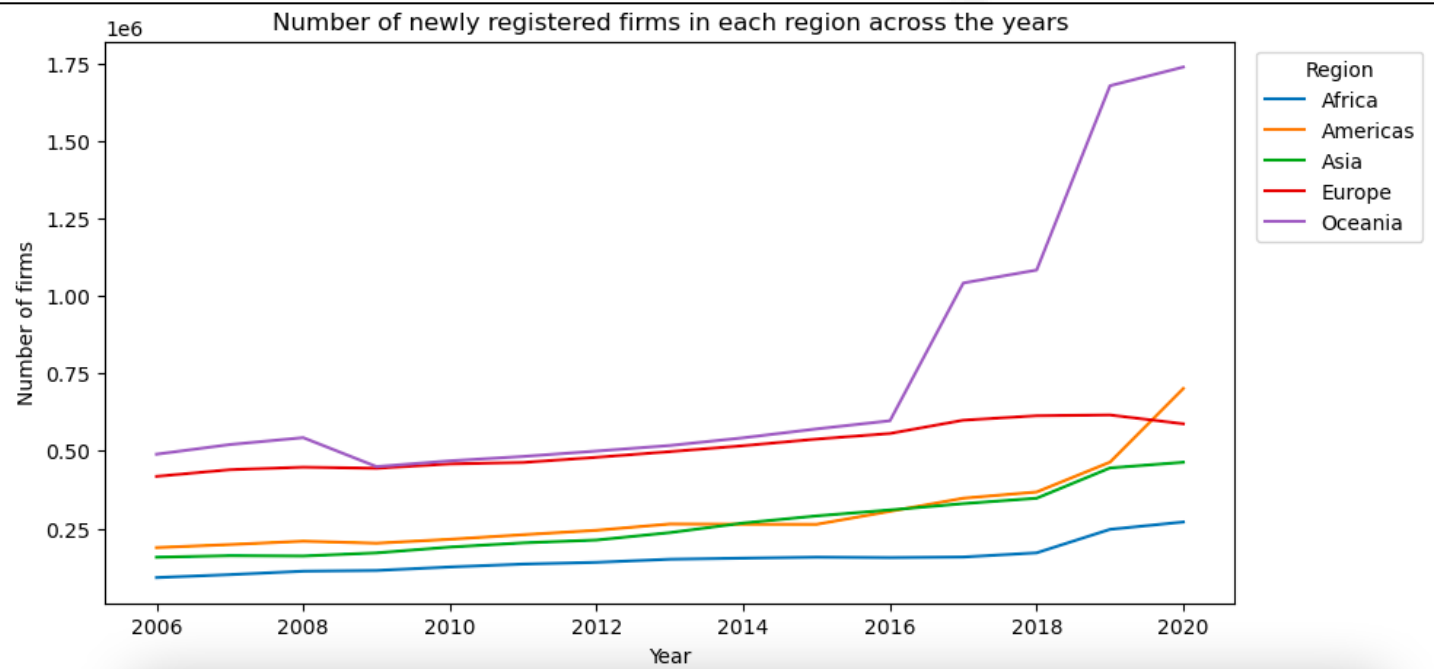
Access to Electricity in each region over years



Europe has maintained nearly 100% access to electricity since 2000. Other regions have shown a steady increase in electricity access. African countries reported the lowest access to electricity.



# Health of private sector



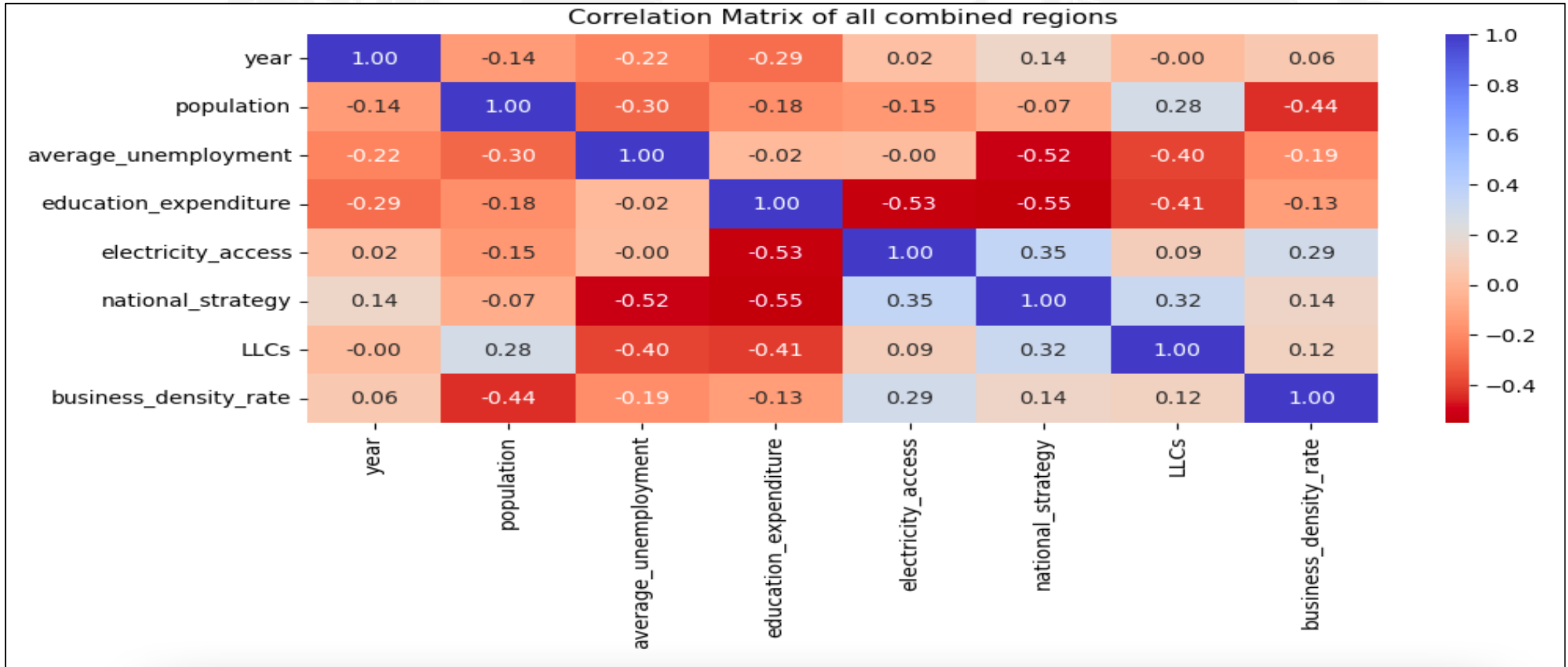
LLCs and Business density rate serve as an indicator of entrepreneurial activity and business creation.

When ranked by these indices, the regions ordered from highest to lowest as follows: Oceania, Europe, the Americas, Asia, and finally, Africa.



# Correlation insights of all regions

Based on the negative correlation albeit weak in some cases, improving each factor led to reduced unemployment rates. Important factors affecting unemployment across regions were government strategies for youth employment and LLCs



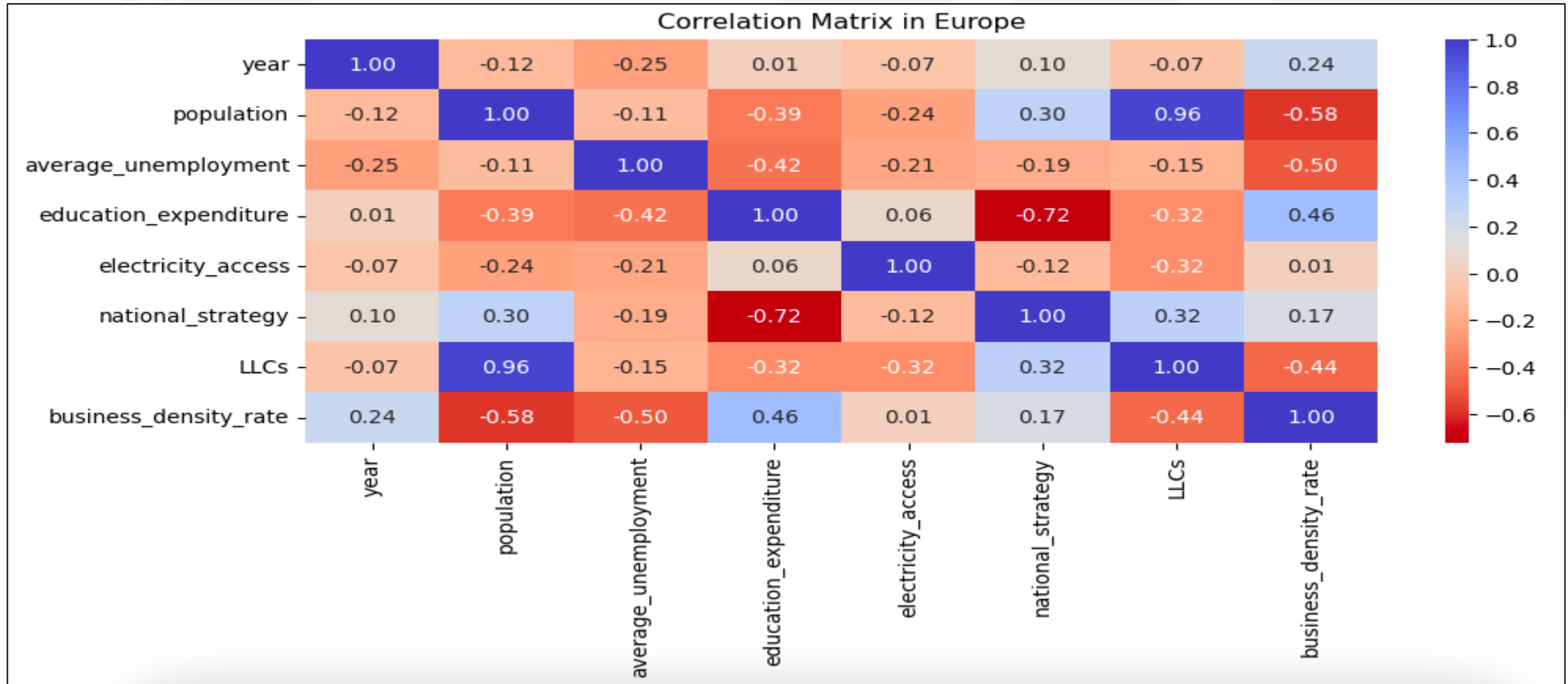
Europe



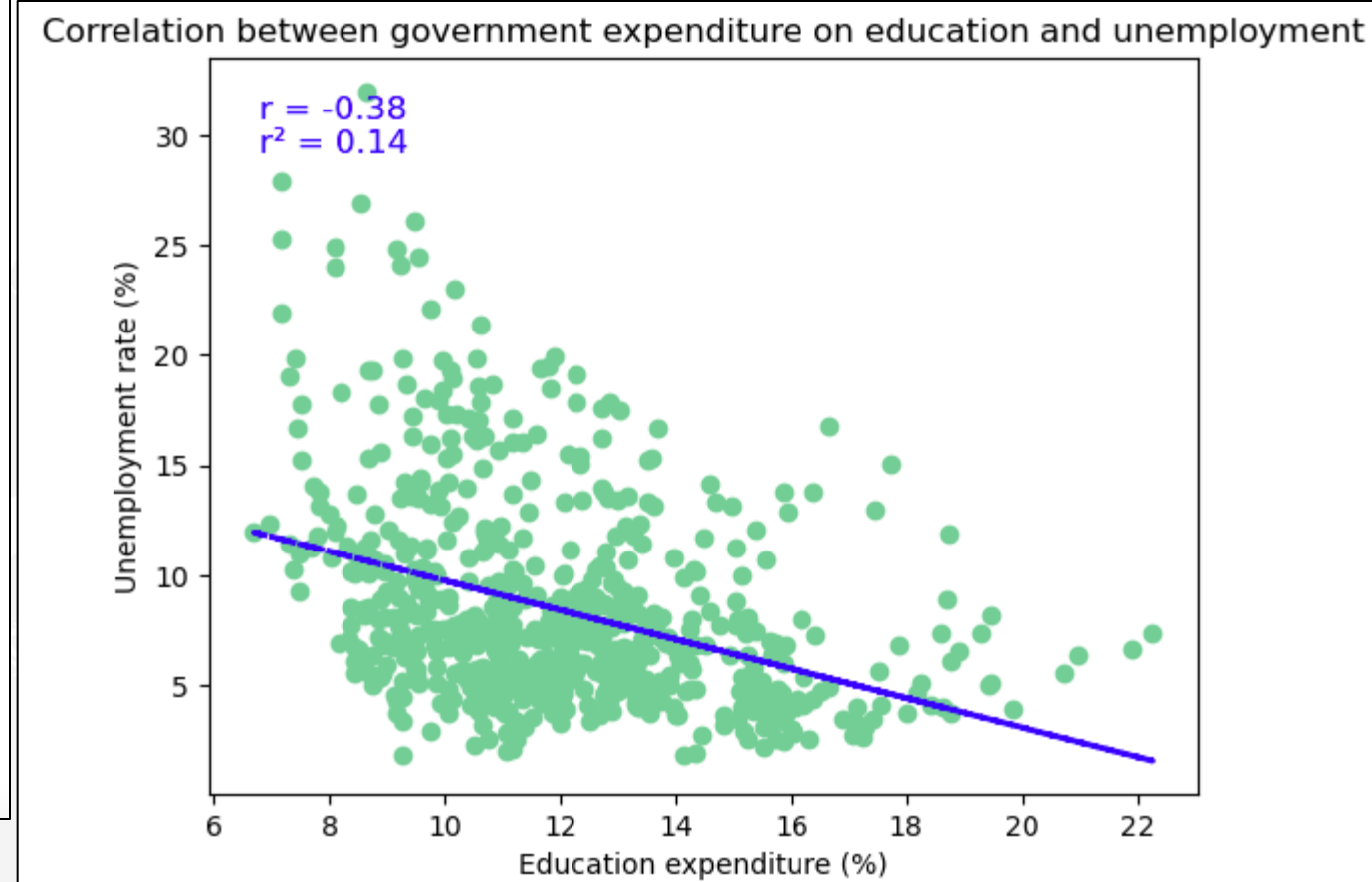
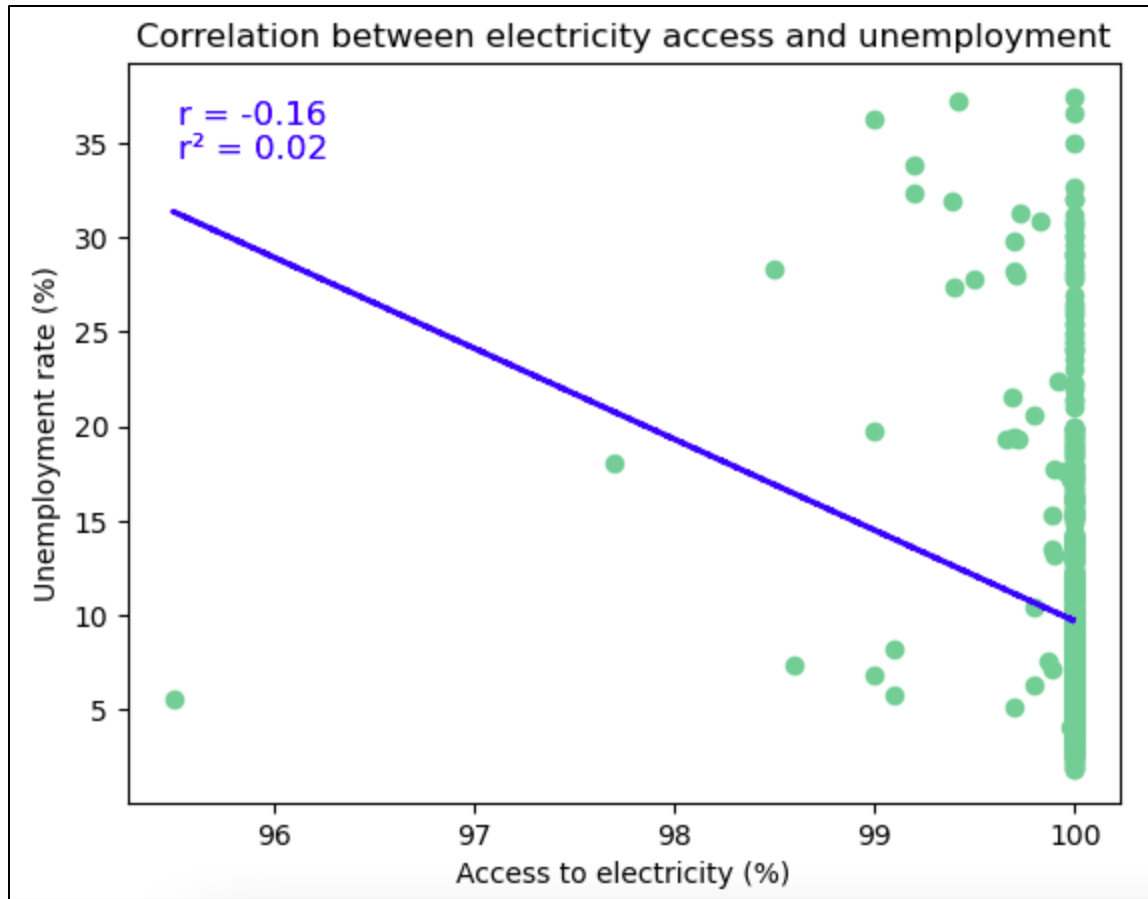
# Correlation insights in Europe

The negative correlations between unemployment and all factors suggest each collectively contributed to reducing unemployment rates.

Among these factors, the business density rate had the most significant impact on unemployment.

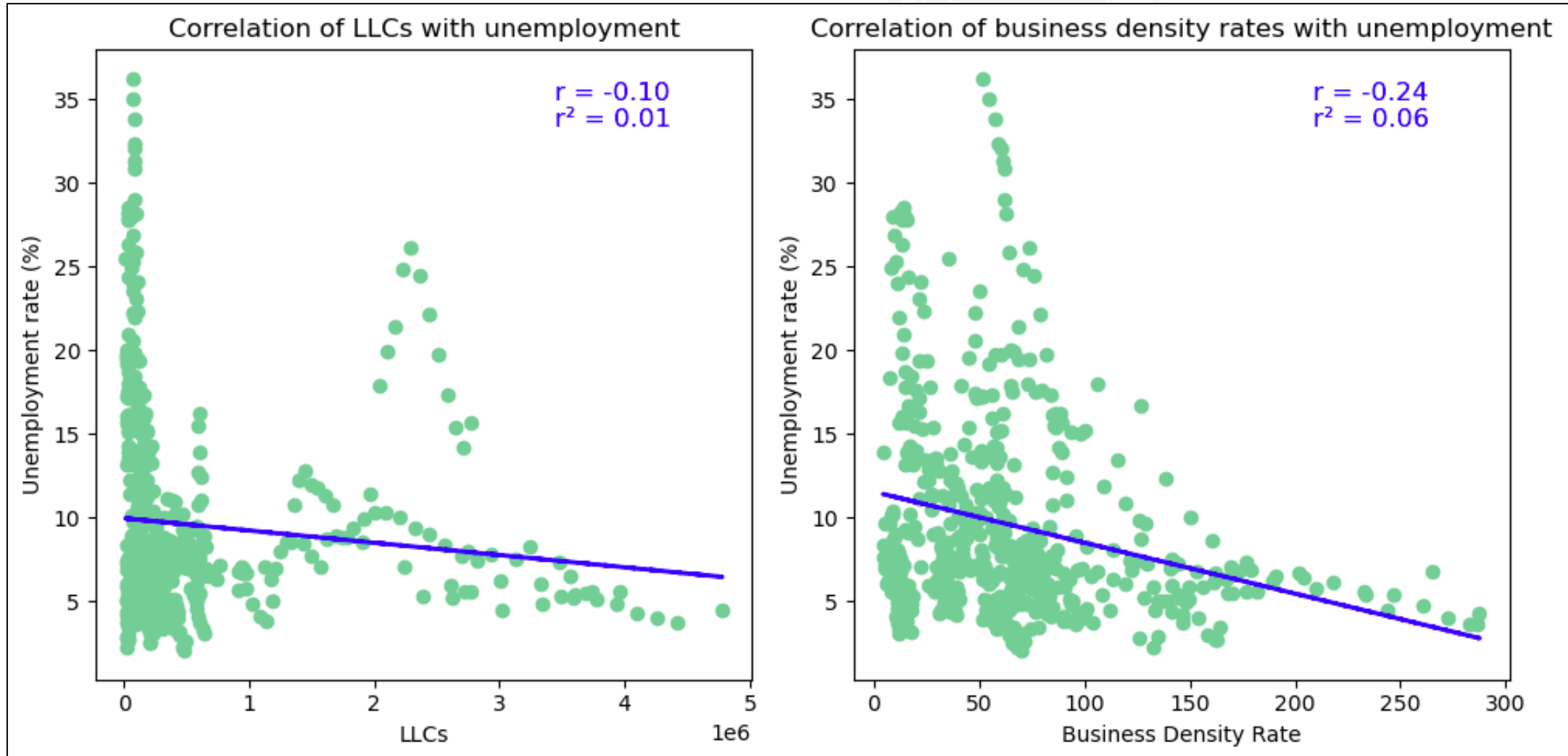


# How does education & electricity affect unemployment in Europe?



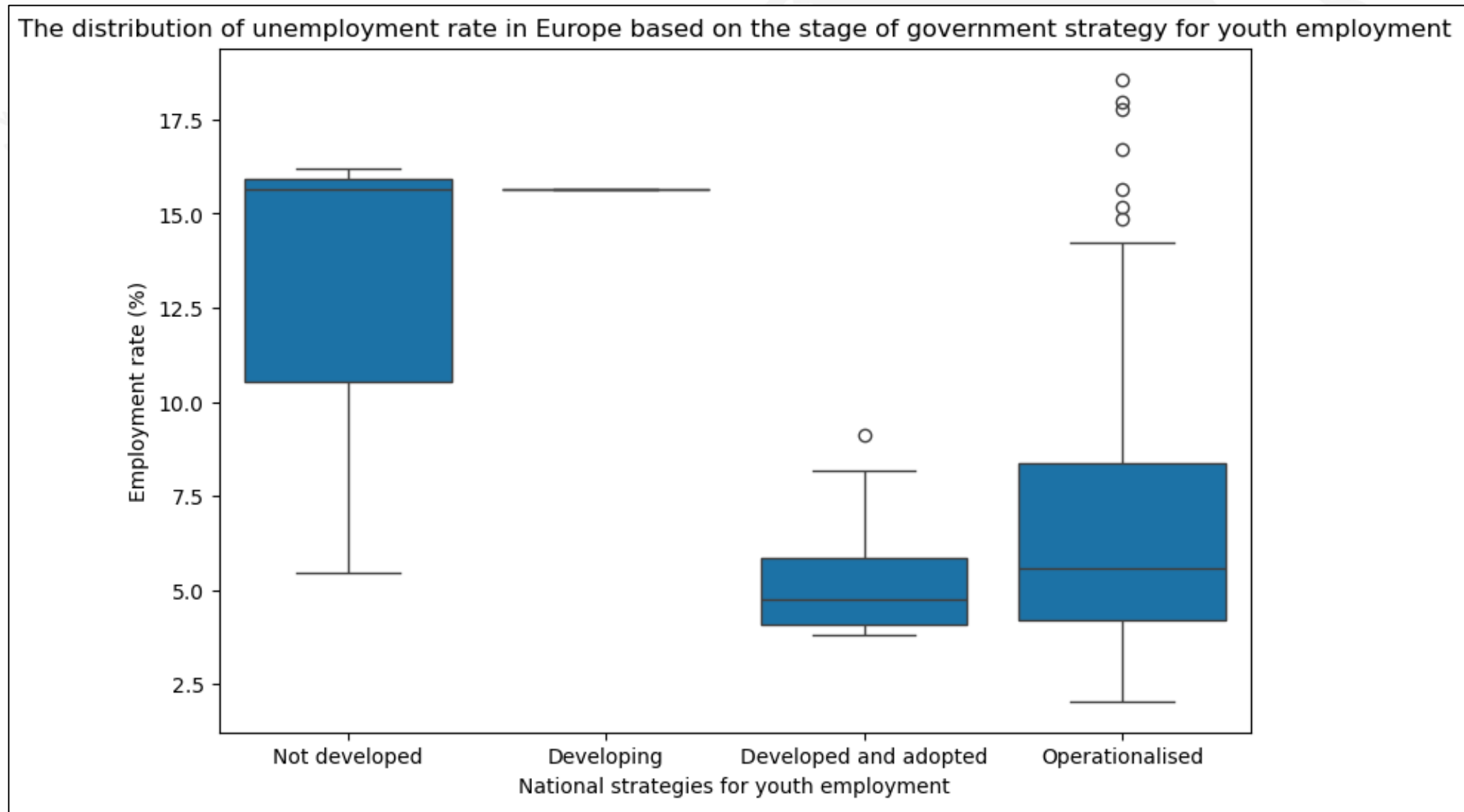
Although access to electricity led to decrease in unemployment, it is not a strong predictor of unemployment. Education expenditure seemed to play a bigger role in reducing unemployment in Europe.

# Impact of firms and business density rates on unemployment in Europe



The increase in the number of new firms registered and the business density rate contributed to a decrease in unemployment in Europe. This shows a healthy private sector plays key roles in tackling unemployment.

# Operationalized national strategies on youth employment greatly reduced unemployment in Europe



Africa

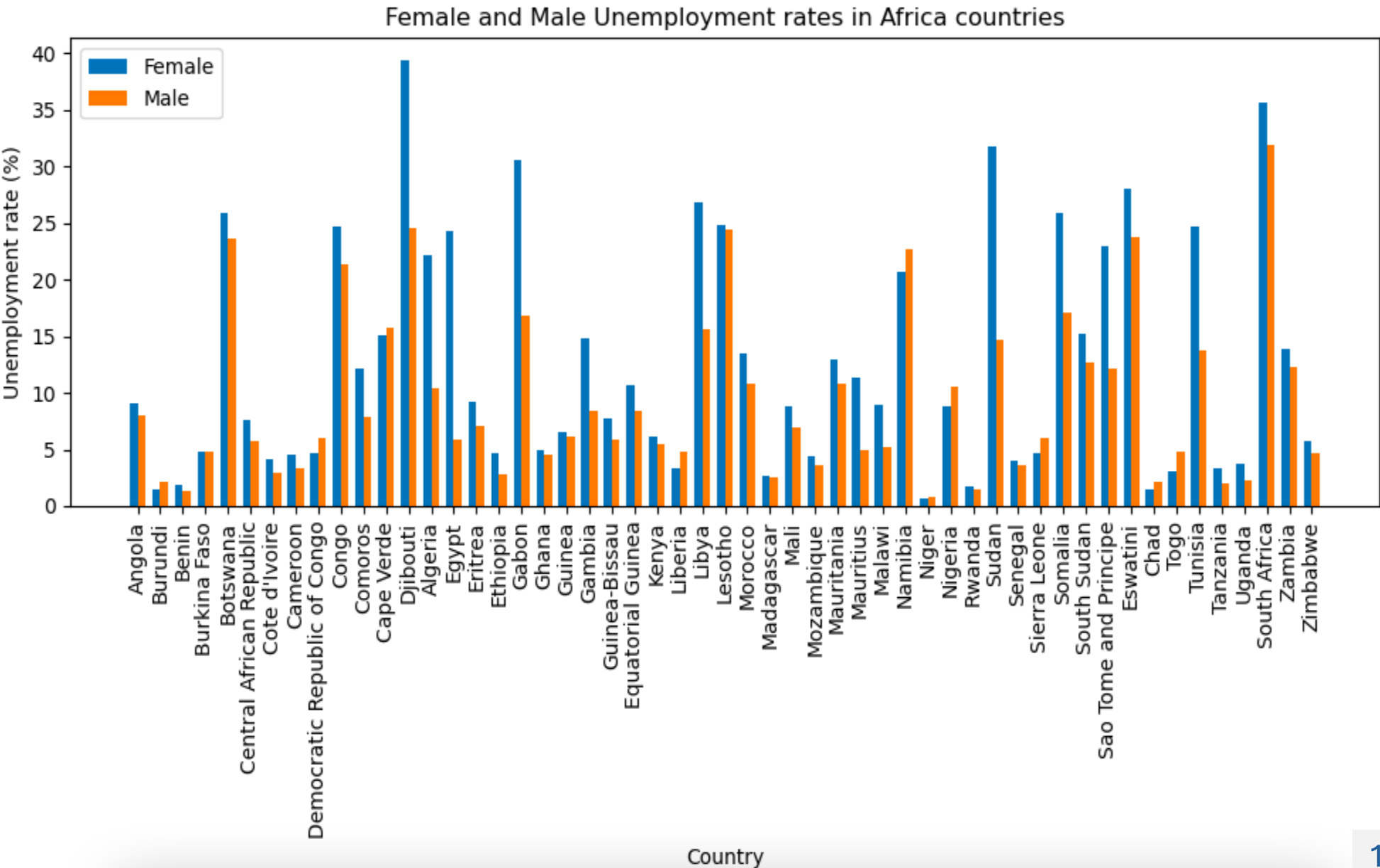




# Significant disparities exist in unemployment rates between men and women

Disparity is striking in several countries, including Djibouti, Gabon, Libya, Sudan, and Tunisia.

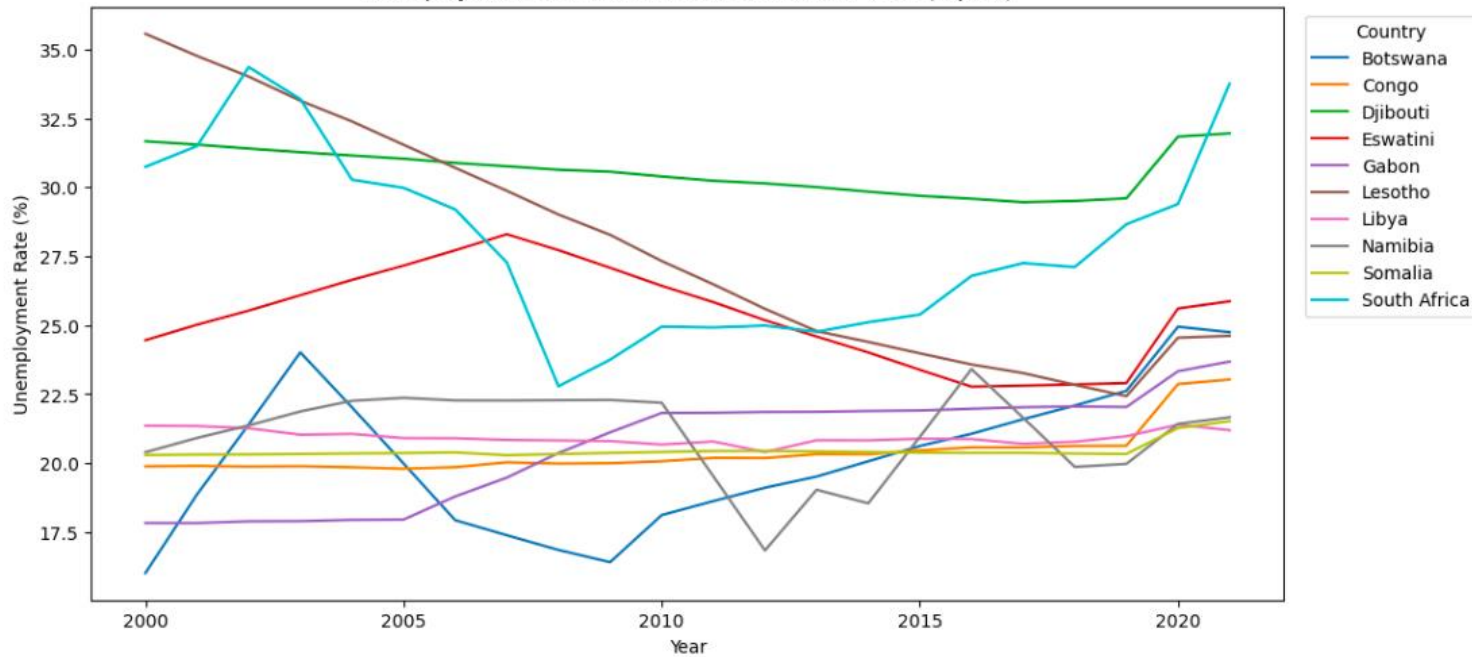
Several countries like Nigeria, Namibia, DRC and Togo reported higher male unemployment rates.



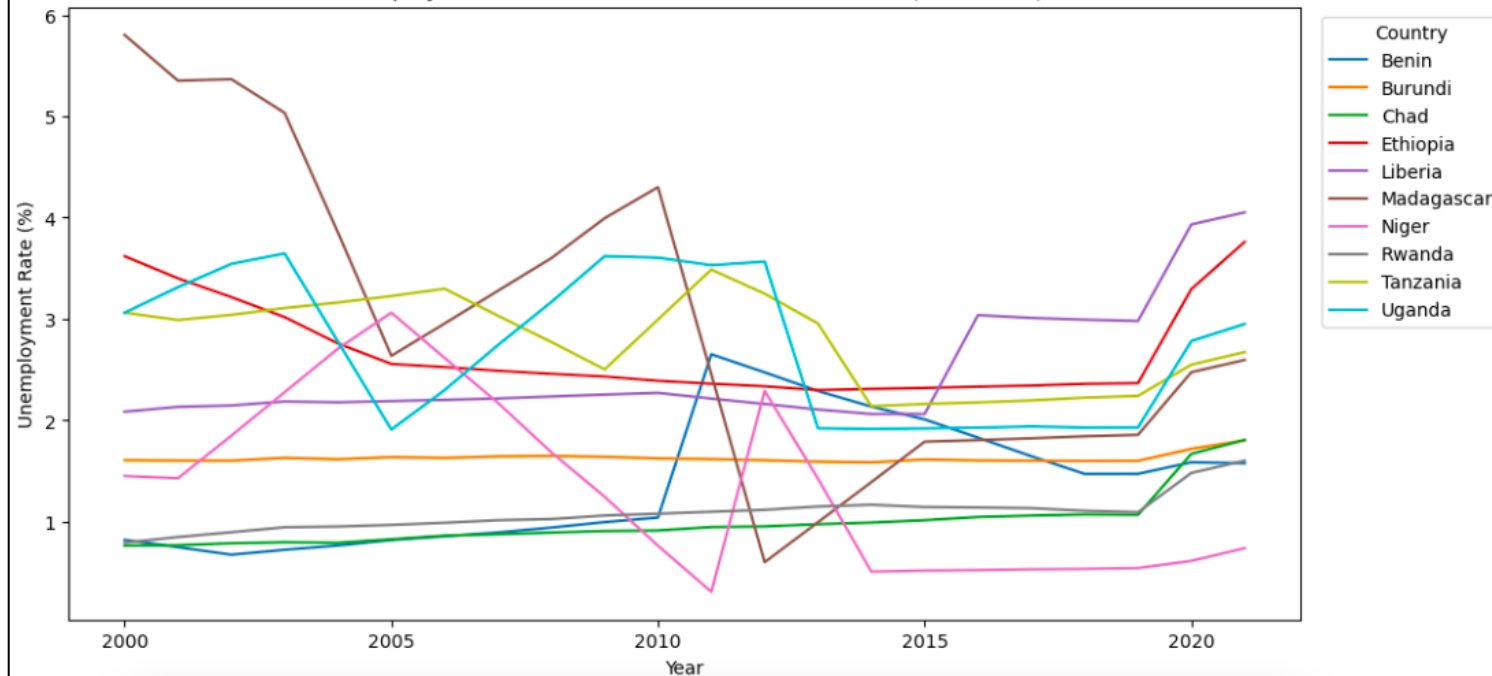
# Examining African countries by unemployment rates

Analyzing the relationships among various factors in both high and low unemployment-rated countries could offer valuable insights into the true effects of these factors on unemployment in Africa.

Unemployment Rate in African Countries Over Years (Top 10)



Unemployment Rate in African Countries Over Years (Bottom 10)

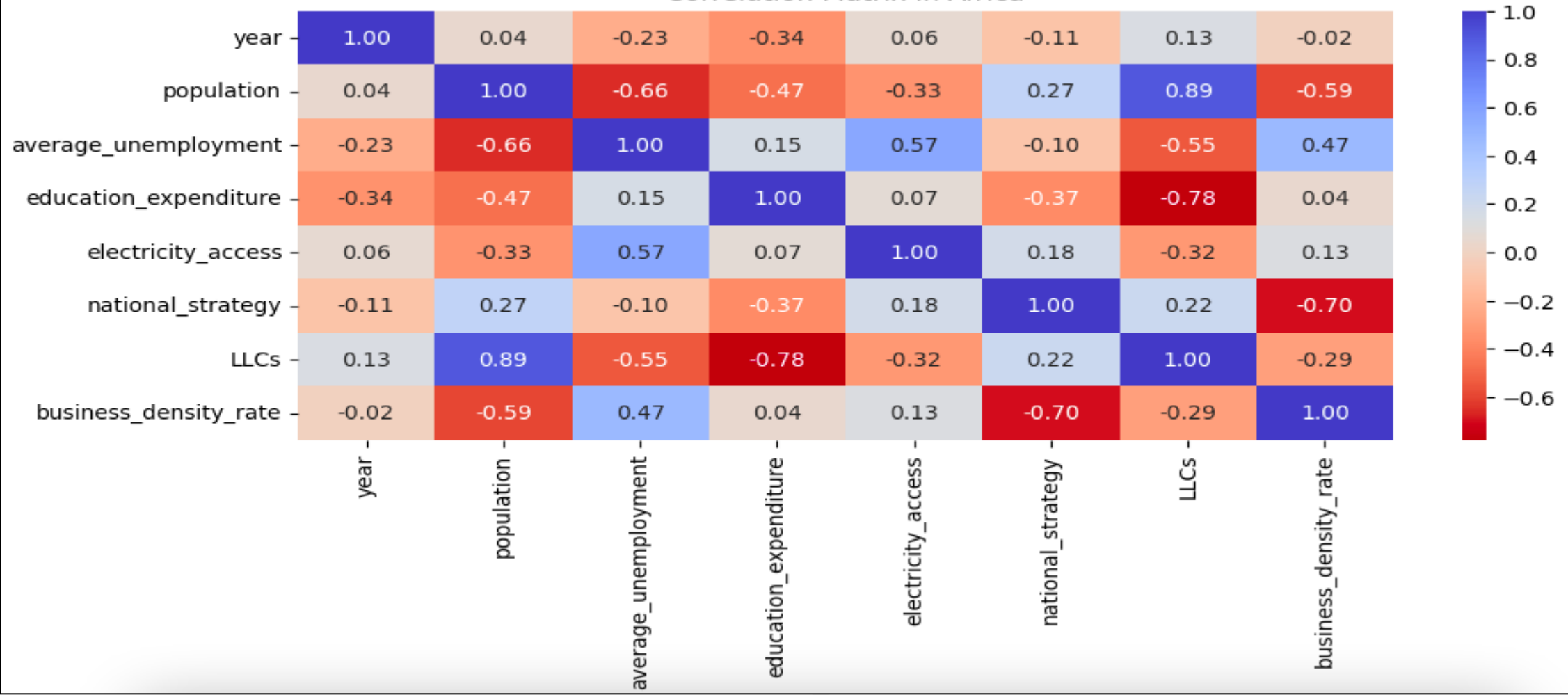


# Correlation insights in Africa

The negative correlation between unemployment and the number of limited liability companies (LLCs) suggests that countries in Africa are lagging in the registration of new firms each year.

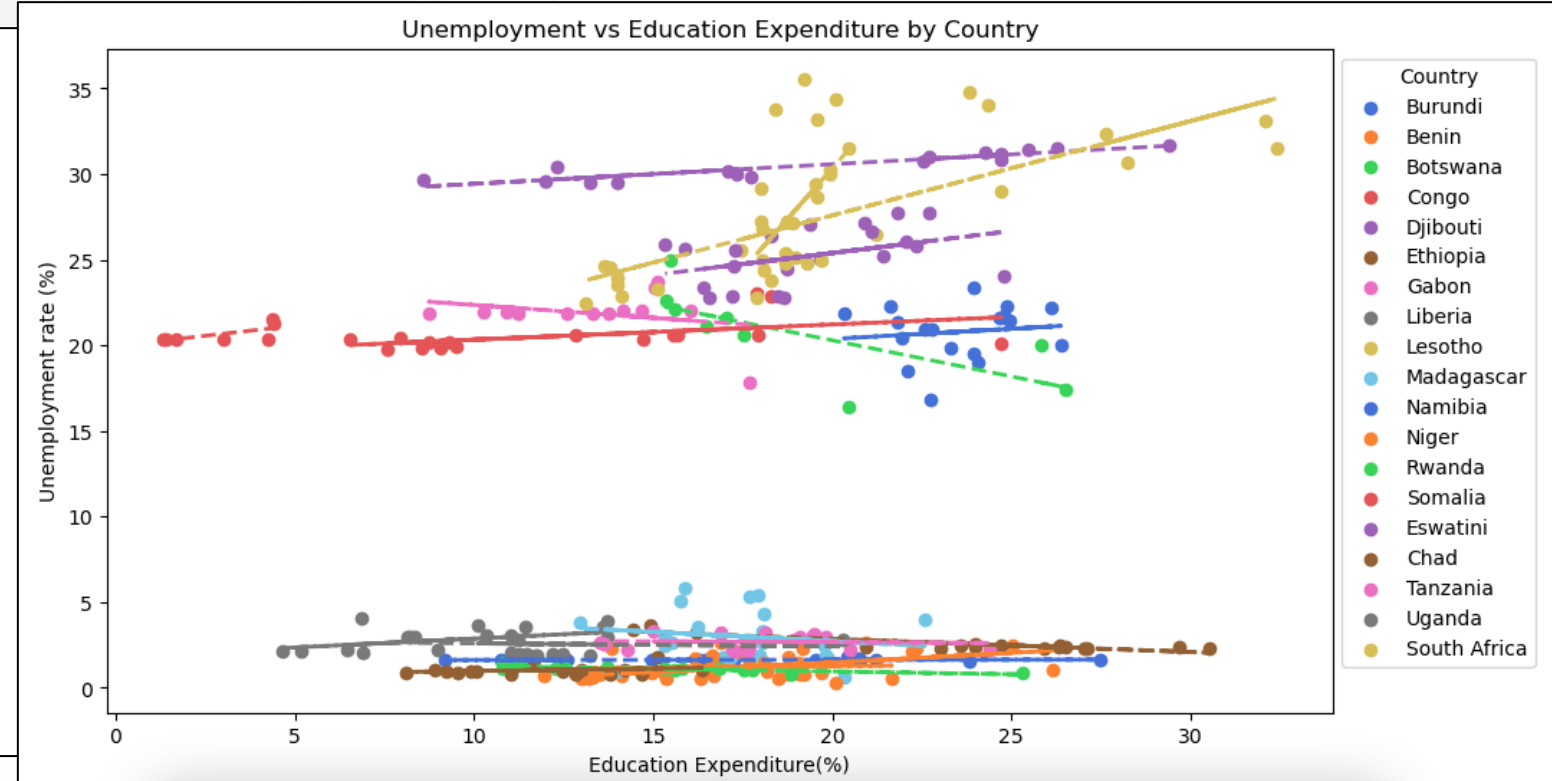
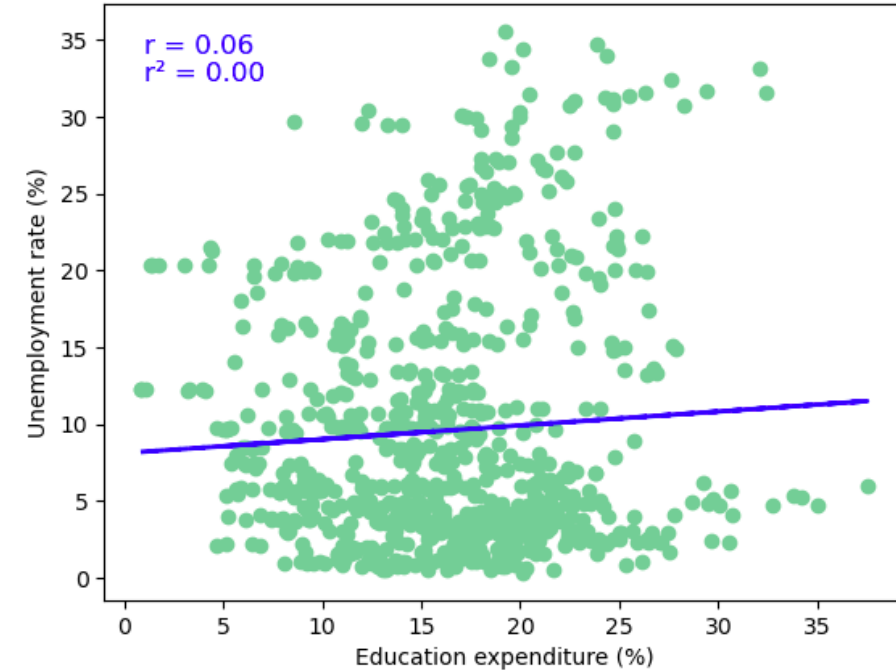
Surprisingly, positive correlations exist between unemployment rates and access to electricity and business density rates in African countries.

Correlation Matrix in Africa



# Education seems to have no effect on unemployment rate in Africa

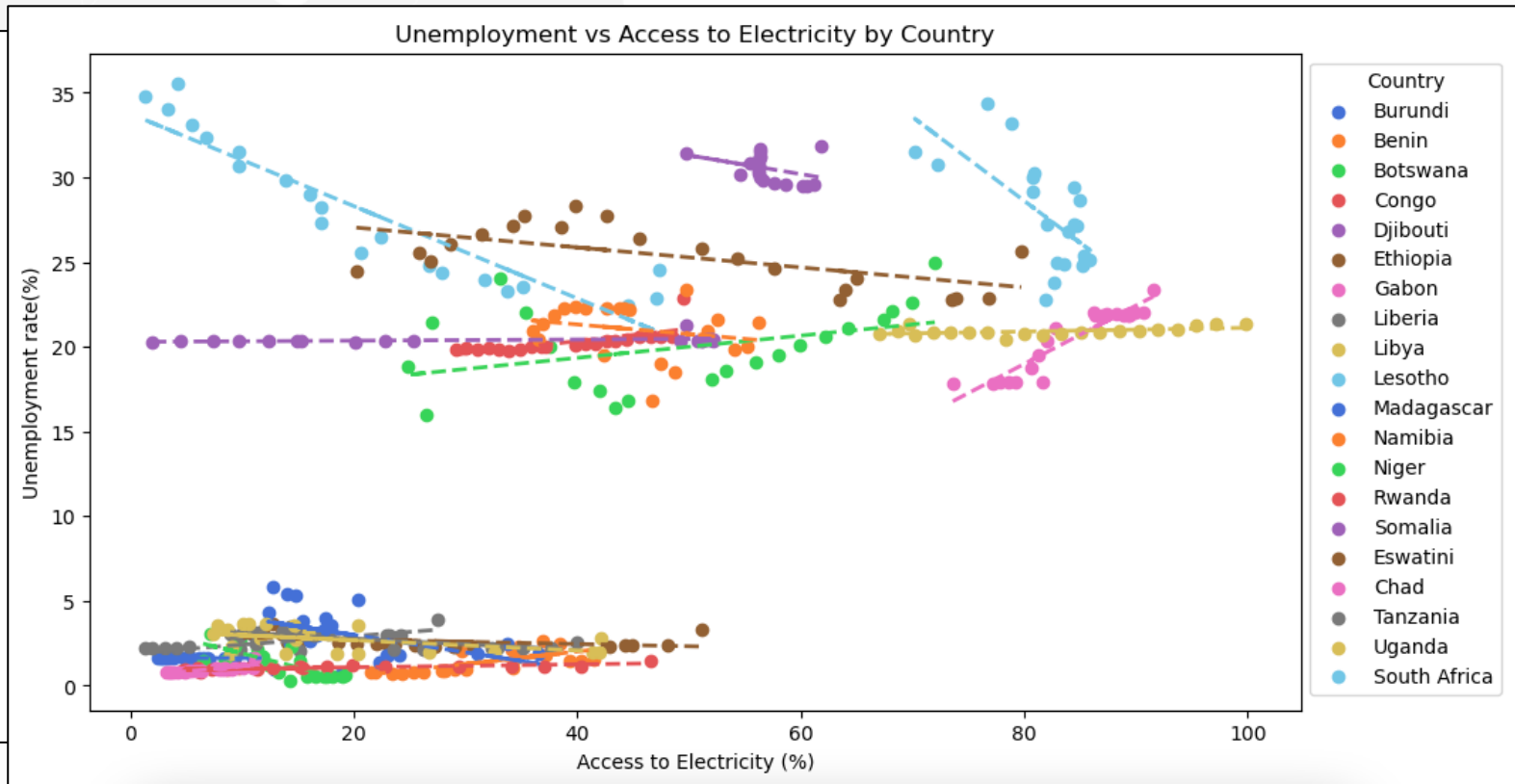
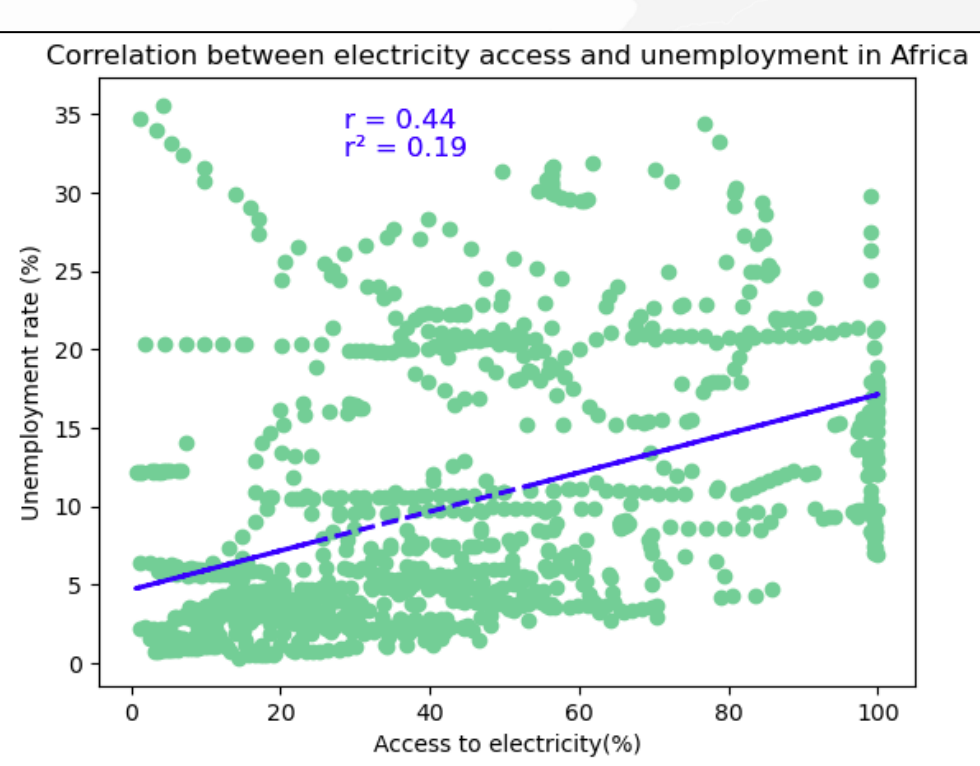
Correlation between education expenditure and unemployment in Africa



Problems with quality of education or mismatch of skills?

Other factors influence unemployment in Africa, perhaps limited job creation or economic dependency on certain sectors.

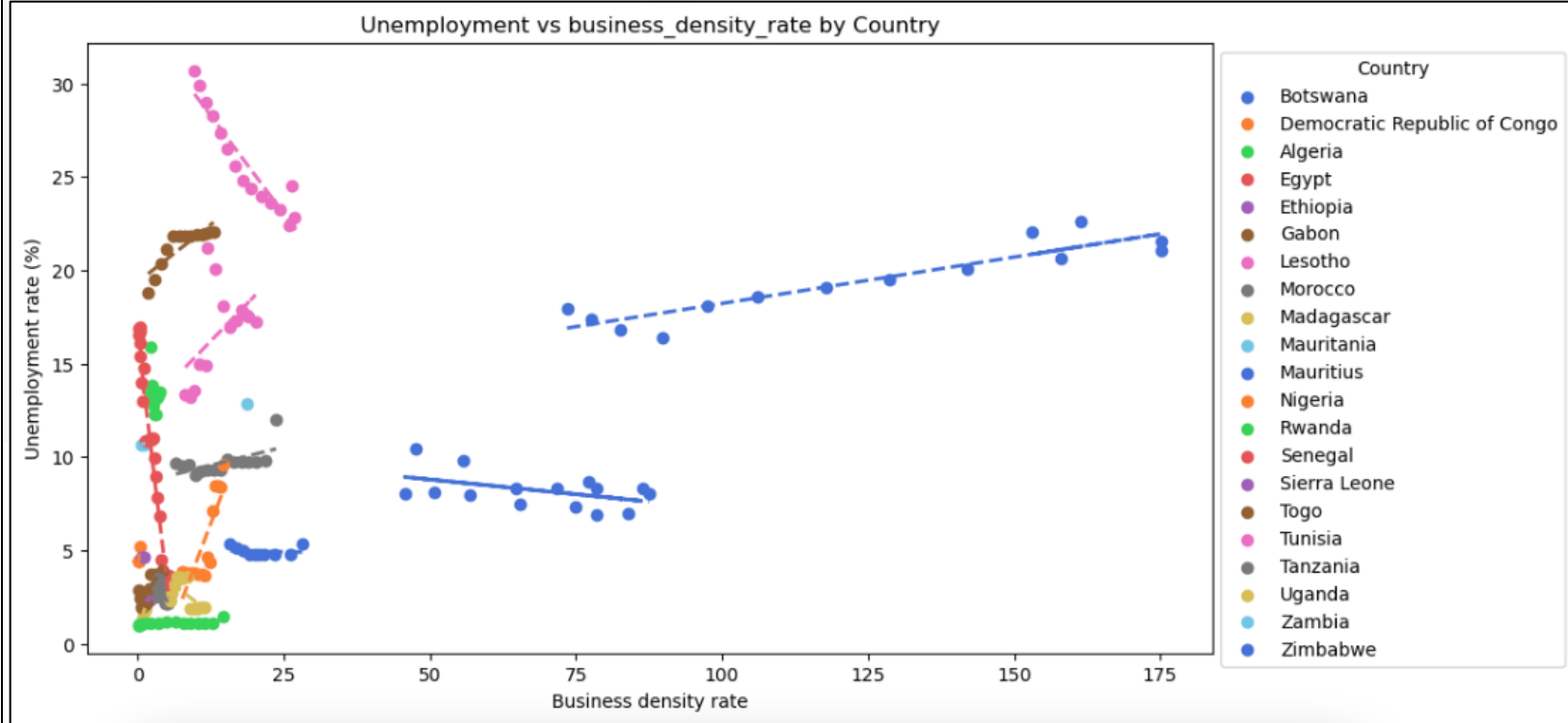
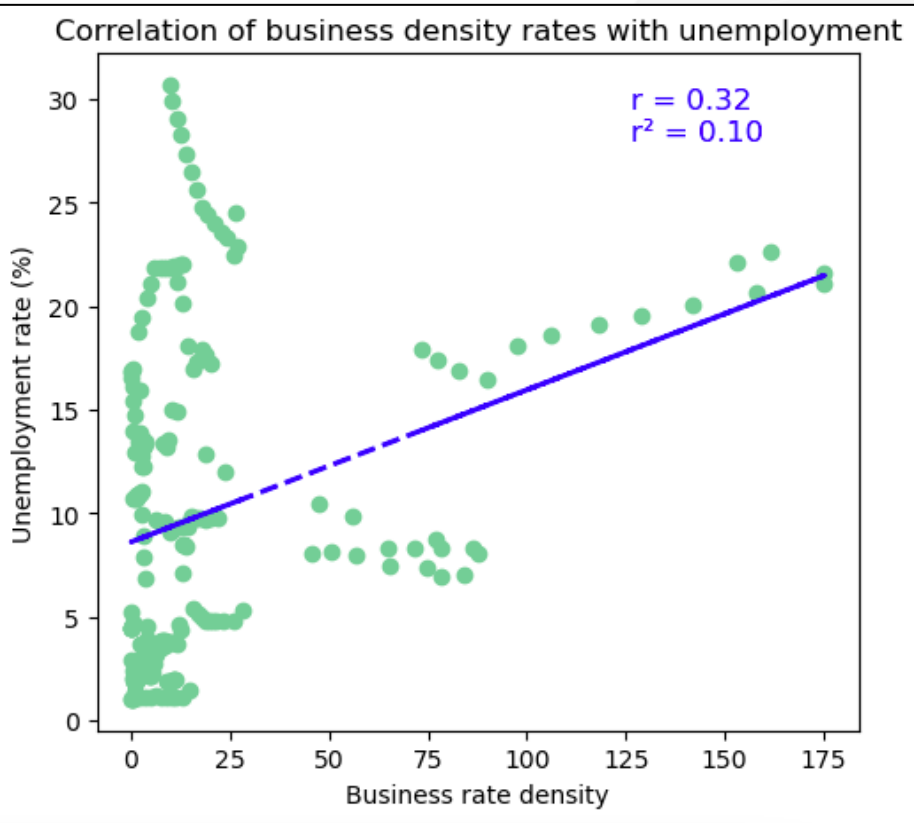
# On a holistic view, electricity access increases unemployment



In some African nations, such as Rwanda, Namibia, and Chad, unemployment rates were below 5%, despite having less than 50% access to electricity.

Analyzing the data points and trendlines for most countries suggests that even in those with high unemployment rates, there is a tendency for unemployment to decrease as access to electricity improves, particularly observed in Lesotho.

# Business density rates on unemployment in Africa

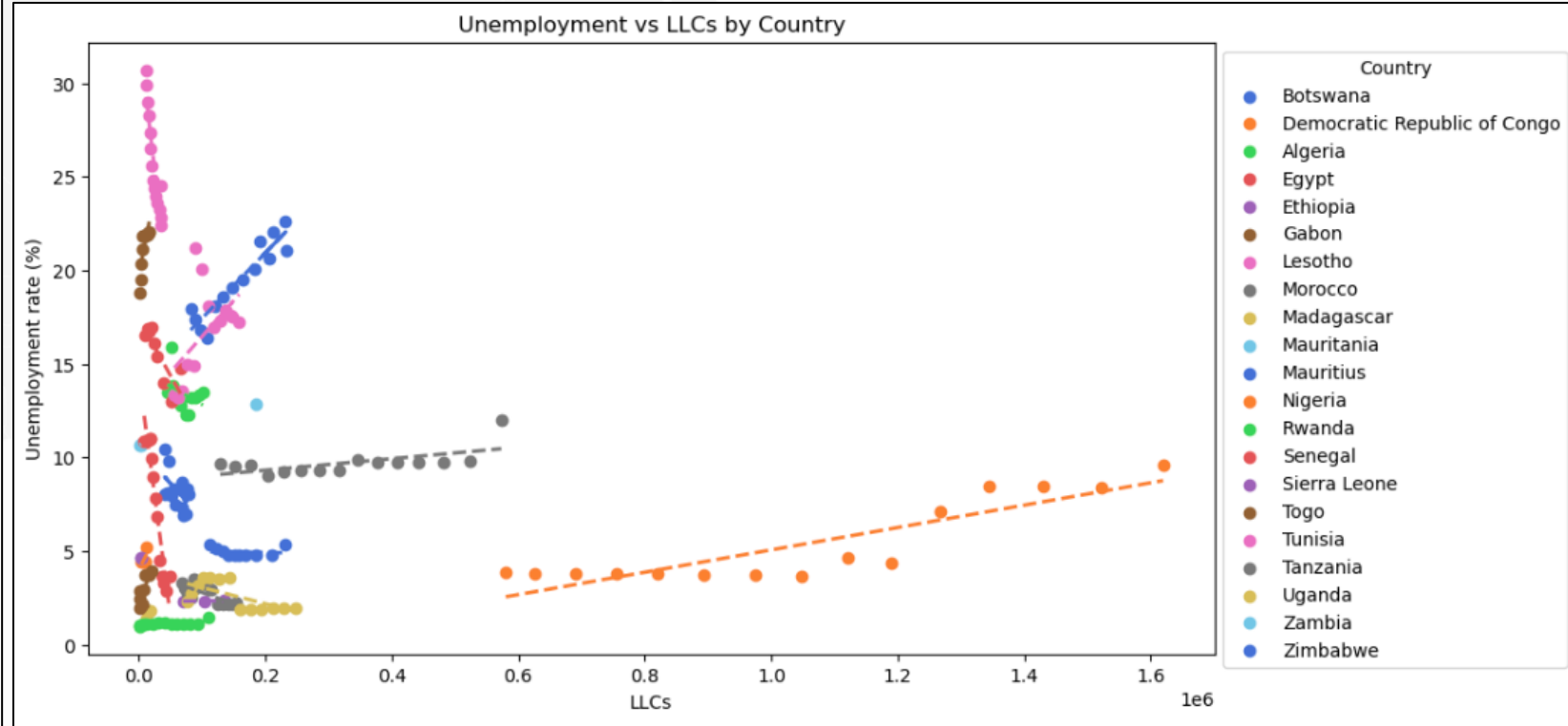
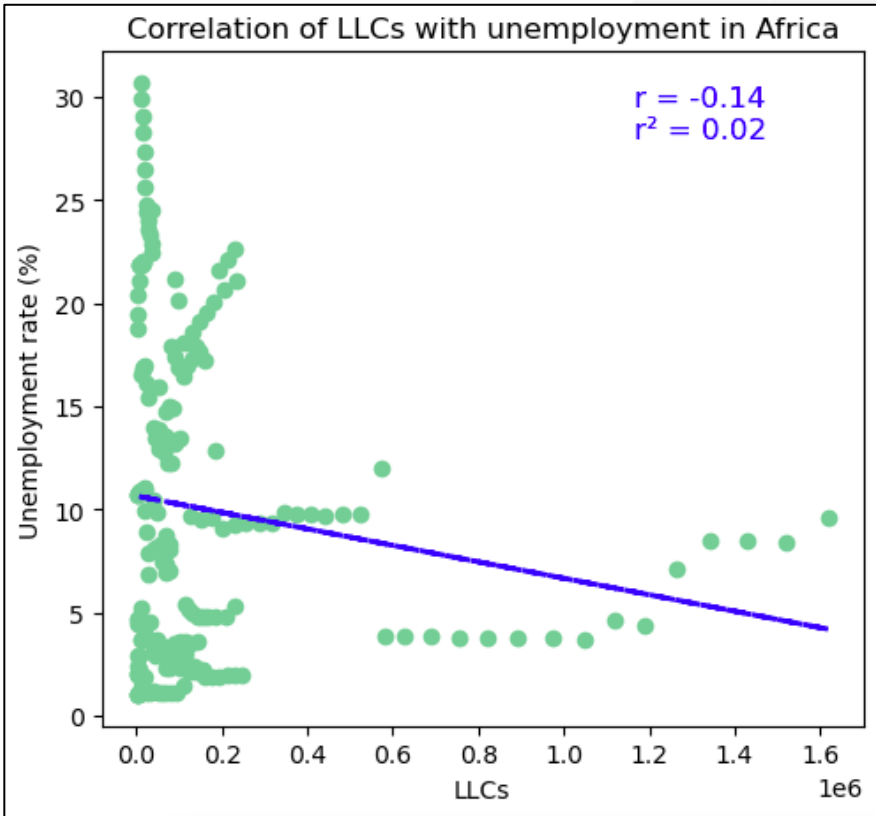


Are business density rates not an important factor when considering unemployment rates in Africa?

Increase in business density rates is associated with higher unemployment, suggesting that this factor may also warrant further study on a country-by-country basis.



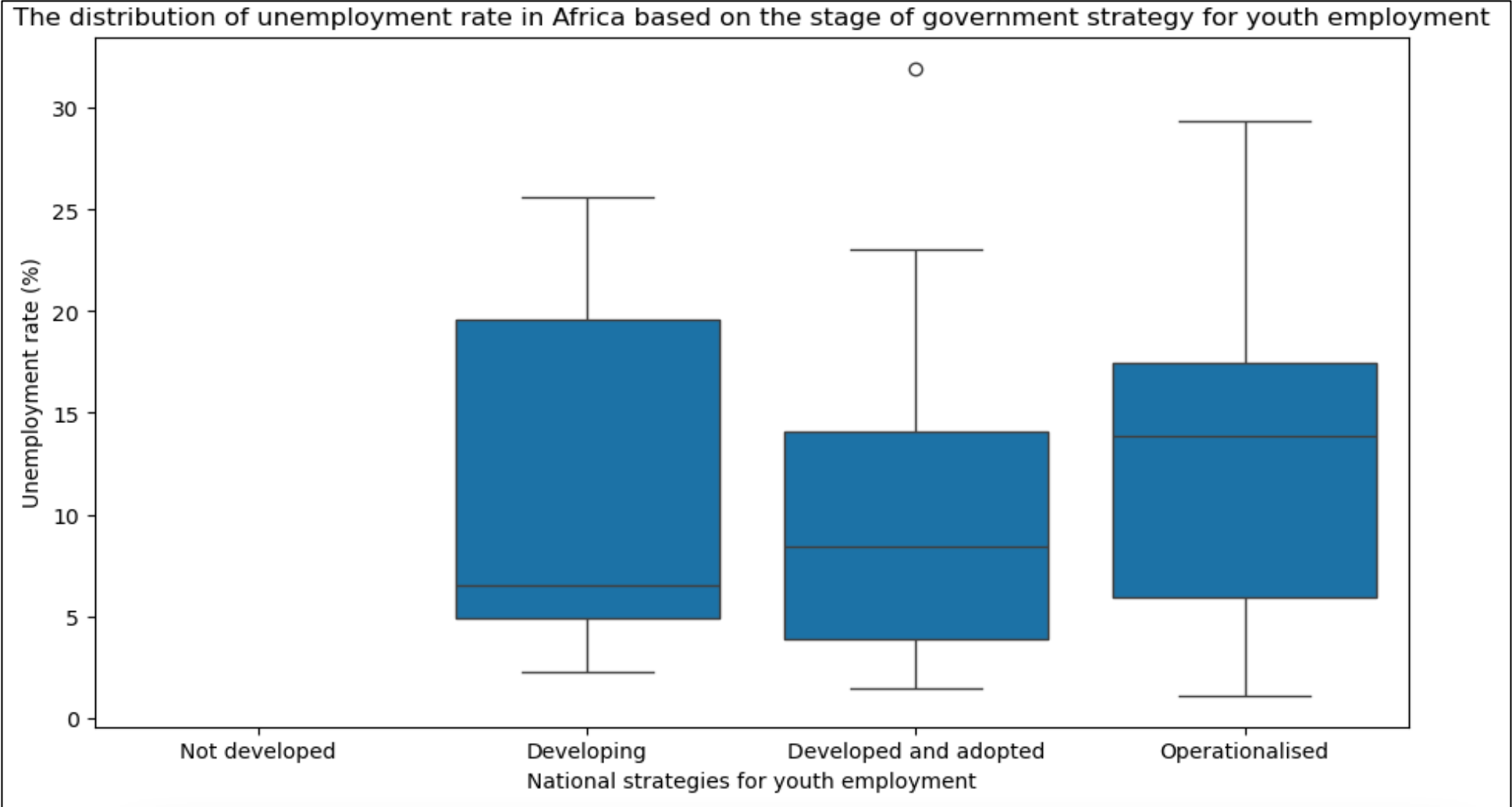
# Low number of LLCs contributes to higher unemployment rates



It is important to note that despite the recorded  $r$  values, the data points in both LLCs and business density rate plots were predominantly clustered close to the y-axis. This pattern signifies that most African countries have low levels of both LLC registrations and business density rates.



# Several African countries have developing strategies on youth employment



While several African countries have operationalized strategies on youth employment, the unemployment rates in several of these countries seem to be higher than those with developing strategies

# Summary

Access to electricity, government's expenditure on education, country's private sector and national strategies on youth employment are important factors that reduced unemployment rates in Europe, a region with the highest unemployment rates between 2010 -2015.

Given the unique socio-economic dynamics in Africa, adopting a similar approach might seem futile holistically as only increasing the number of new firms seem to improve unemployment challenges.

However, on country-specific studies in Africa, it becomes evident that increasing access electricity also reduced unemployment rates.

# Recommendations

A comprehensive analysis on the quality of education in African countries could provide valuable insights into education as a viable strategy for reducing unemployment in Africa.

Nations should strive to expand electricity access to leverage both direct and indirect benefits on unemployment rates in accordance with their strategies.

Governments should actively encourage the establishment, sustainability, and expansion of businesses to boost business density rates.

Countries should gather and analyze additional data on other potentially influential factors such as economic sectors, access to financing and other government policies to provide more actionable and detailed insights.

# Conclusion

Improving several of these factors will guarantee that unemployment rates in Africa reduce in the coming years.

Ultimately, it's essential for African countries to approach unemployment solutions individually, identifying patterns within their specific contexts and drawing on similarities with other regions only where relevant.

Tailoring solutions to each country's unique economic and social landscape will likely yield more effective results than a broader approach.