

Do countries with high female secondary completion rate tend to have higher female labour force participation?

Elise Alstad

- Please check out my JupyterNotebook:

[https://github.com/lalelisealstad/DSE200x\\_Python  
\\_DataScience](https://github.com/lalelisealstad/DSE200x_Python_DataScience)

# Dataset(s)

- World Development Indicators. Source:  
<https://www.kaggle.com/datasets/theworldbank/world-development-indicators>

## **Supplementary datasets:**

- Country - Region mapping. Source:  
<https://www.kaggle.com/datasets/andradaolteanu/country-mapping-iso-continent-region>
- GeoJSON data created by the Natural Earth project.  
Source:[http://geojson.xyz/naturalearth-3.3.0/ne\\_50m\\_admin\\_0\\_countries.geojson](http://geojson.xyz/naturalearth-3.3.0/ne_50m_admin_0_countries.geojson)

# Motivation

The motivation for the research question “Do countries with high female secondary completion rate tend to have higher female labour force participation?” is because improving female labour force participation can have numerous positive benefits on the economy and for female empowerment. Namely, research show that female labour force participation have positive effects on economic growth and by participating in the labour force, women gain economic independence and increase household income (Verick, 2018).

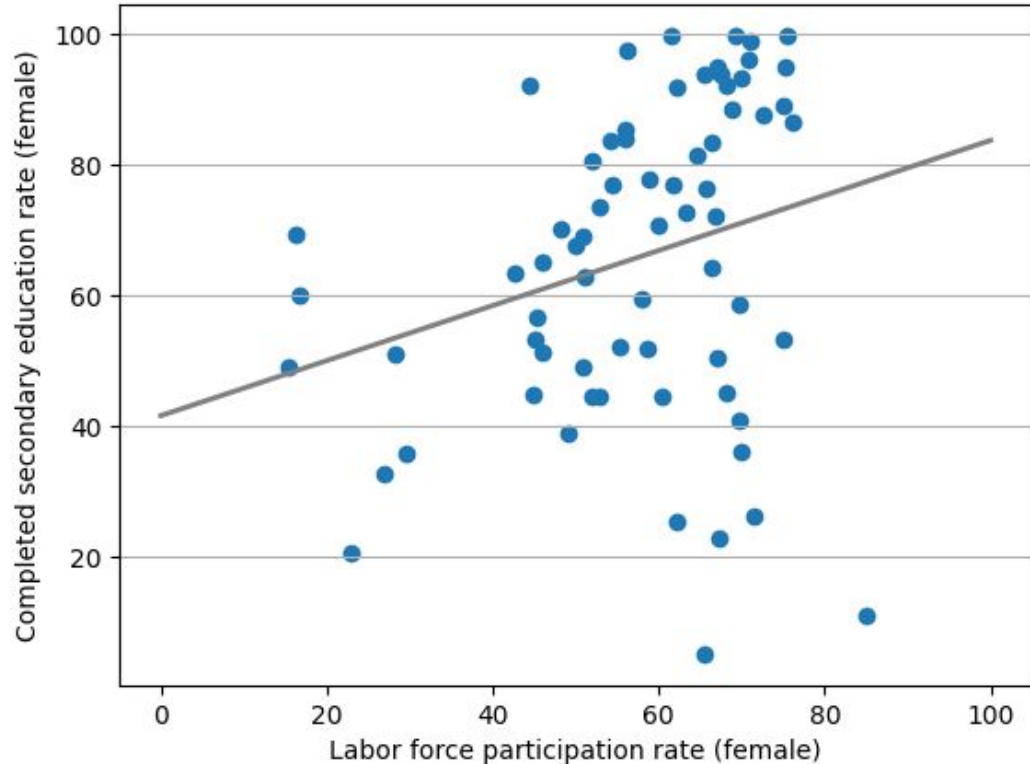
It is important to understand what factors can increase increase labour force participation so that decision makers create policies that enhances female labour force participation. Therefore, I will assess if there is a correlation between female labour force participation rate and female education rate, to understand improving education amongst females may contribute to increasing labour force participation. Moreover, I selected female education because I find it meaningful variable to assess, as ensuring female education has many positive influences on females lives, such as improved health and life skills (Unicef).

## Research Question(s)

Do countries with high female secondary completion rate tend to have higher female labour force participation?

# Visualizing correlation with a scatter plot with a regression line

Labor force participation rate (female) vs. Completed secondary education rate (female) in 2010



# Correlation

- Do countries with high female secondary completion rate tend to have higher female labour force participation?”
- As we can see from the figure, there is a positive correlation between Female Education rate and female labour force participation.
- Similarly, the correlation coefficient between the two variables is: 0.266 which confirms that what we see from the figure:
  - *Countries with high female secondary completion rate tend to have higher female labour force participation.*

# Bubble chart

Labor force participation rate (female) vs Completed secondary education rate (female) in 2010





# Bubble chart analysis

- I use Plotly to make the bubble chart because Plotly figures are interactive so I can hover over the bubbles and see which country it is and the exact values it has. I use the interactive components of Plotly figure to understand outliers.
- From the figure, I can see that some countries not following the trend.
  - Namely, we can see a few African countries with very low female education rate but very high labour force participation amongst females. For example, Rwanda has the lowest second female education completion rate in 2011 but highest female labour force participation.
  - Contrastingly, Jordan and Italy have a similar level of Completed secondary education rate amongst females, at 69 per cent, but Jordan have a very low female labour force participation rate, at 16 per cent while in contrast, in Italy 51 per cent of females participate in the Labour market.
- Seeing the outliers tell me that female education cannot be the only key to female labour force participation and that other factors may play a role.

# Summary

- From the data visualisation using scatter plot and by calculating the correlation coefficient, we see a positive correlation, and I can therefore answer my research question.

***Yes, countries with high female secondary completion rate do tend to have higher female labour force participation.***

- However, in my motivations, I noted that I wished to understand if improving female education rate can contribute to increase female labour force participation. But even if we see a correlation in the results, this does not mean there is a causation. Moreover, as I saw from analysing the outliers in the bubble chart, many countries do not have high female labour force participation even with high education, and vice versa. Thus, as also other research suggest, the contributing factors to female labour force participation are numerous and complex (Verick, 2018). Answering the question from my motivations falls outside of the scope of this mini project, but it would be an interesting avenue to explore for later analysis.
- In this mini project I illustrated a positive relationship between female education and labour force participation and could answer my research question.

# Acknowledgements

Bubble chart inspired by Hans Rosling in Ted Talk: The best stats you've ever seen | Hans Rosling:

- <https://www.youtube.com/watch?v=hVimVzgtD6w>

# References

Definitions from the World Bank Metadata Glossary:

- <https://databank.worldbank.org/metadataglossary/all/series>

Python Folium: Create Web Maps From Your Data:

- <https://realpython.com/python-folium-web-maps-from-data/>

Verick, S. Female labor force participation and development. IZA World of Labor 2018: 87 doi: 10.15185/izawol.87.v2:

- <https://wol.iza.org/articles/female-labor-force-participation-and-development/long>

Girls' education, Unicef:

- <https://www.unicef.org/education/girls-education>