

Analysis of Correlation Between Working Time Duration and Productivity Index in EU and OECD Countries

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1. Introduction

The objective of this experiment was to investigate the relationship between labor intensity and economic efficiency. Specifically, the research question posed was: *Does a statistically significant negative correlation exist between the average weekly hours actually worked per employee and the rate of labour productivity (GDP per hour worked) in developed economies?* The analysis focuses on selected European and OECD countries over the period 2014–2024.

2. Data Description

To ensure the reliability of the study, data was sourced from two independent, authoritative international organizations:

- **Working Time Data:** Obtained from Eurostat (Table: tps00071). This dataset provides the average number of actual weekly hours of work in the main job for full-time employees.
- **Productivity Data:** Obtained from the OECD Productivity Database. Crucially, to ensure valid cross-country comparisons, the productivity metric (GDP per hour worked) was selected in Purchasing Power Parity (PPP) units (US Dollars), eliminating distortions caused by currency exchange rate fluctuations.

3. Methodology

The data processing involved the following steps:

1. **Data Acquisition:** Raw data were downloaded in tabular formats.
2. **Harmonization and Filtering:** Both datasets were filtered to include only those country-year pairs available in both sources for the period 2014-2024.
3. **Data Fusion:** The two datasets were merged into a single analytical table using Country and Year as common identifiers.
4. **Statistical Analysis:** A Pearson correlation coefficient (r) was calculated to quantify the linear relationship between the two variables.

4. Results

The analysis of the merged dataset yielded the following statistical results:

- **Pearson Correlation Coefficient (r):** 0.0220
- **P-value (p):** 0.6998

Interpretation:

The calculated correlation coefficient is extremely close to zero ($r \approx 0.02$), indicating a lack of any linear relationship between the variables in the analyzed sample. Furthermore, the high p-value (0.6998) is well above the standard significance threshold ($\alpha = 0.05$), meaning the result is statistically non-significant.

5. Conclusion

Based on the empirical data from Eurostat and OECD for the years 2014-2024, the hypothesis that longer working hours are correlated with lower productivity cannot be confirmed. The analysis suggests that for the selected group of countries, weekly working hours and hourly productivity are independent variables.

