Economic Development Across Income Groups

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Introduction

Global differences in economic development are a persistent and consequential feature of the global economy that shape patterns of opportunity, wellbeing, and inequality. The World Bank offers classifications that help us examine disparities across countries at different stages of development. In this project, we analyze data from the World Development Indicators (WDI) to compare patterns of economic development across income groups from 2000 to 2023. The project intends to explore these long-term dynamics.

Data Description

Data Sources and Indicators

This project uses data from the World Bank World Development Indicators (WDI) database. We focus on three core measures of economic development: GDP per capita (constant USD), annual GDP growth, and the employment-to-population ratio.

Data Preparation and Cleaning

- The raw WDI data were imported into a SQLite database and reshaped from a wide format into a country–year structure. All indicators were combined into a unified dataset to support consistent cleaning and analysis.
- The dataset was filtered to the 2000–2023 period to ensure comparability across indicators. Country and indicator metadata were separated from yearly observations to streamline analysis, and countries without income group classifications were excluded from income-group-based summaries.

Income Group Classification

Countries were categorized using World Bank income group classifications, which were linked to the country–year data using standard country codes. This framework enables systematic comparison of economic outcomes across income levels.

Summary of Key Variables

- Table 1 summarizes the distribution of GDP per capita, GDP growth, and employment ratios across income groups. GDP per capita differs substantially across income classifications, while GDP growth and employment ratios exhibit more moderate variation.

Table 1: Average GDP per capita, GDP growth, and employment ratios by World Bank income group (2000–2023).

	income_group	n_country_years	avg_emp_ratio	avg_gdp_growth	avg_gdp_pc
0	High income	2064	57.22	2.54	35295.24
1	Upper middle income	1296	53.23	3.57	5815.63
2	Lower middle income	1200	55.21	4.20	2030.59
3	Low income	600	61.35	3.77	703.20

- Table 2 reports yearly average values of GDP per capita, GDP growth, and employment ratios by World Bank income group over the period 2000–2023.

Table 2: Yearly averages of economic indicators by income group.

	income_group	year	avg_emp_ratio	avg_gdp_growth	avg_gdp_pc
0	High income	2000	56.10	4.85	29733.48
1	High income	2001	56.18	2.40	30204.97
2	High income	2002	56.03	2.36	30339.30
3	High income	2003	55.97	3.08	30894.56
4	High income	2004	56.21	4.83	32013.04

Data Analysis

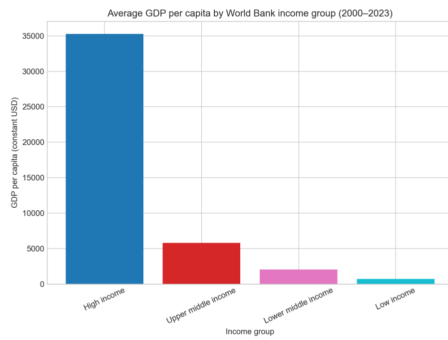

Figure 1: Average GDP per capita by World Bank income group, 2000–2023.

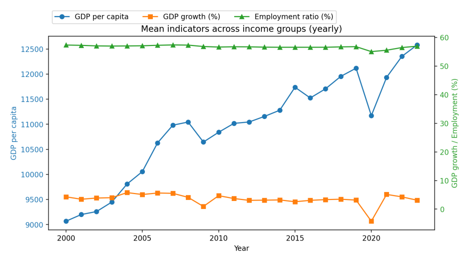

Figure 2: Global mean GDP per capita, GDP growth, and employment ratios over time.

Figure 3: Trends in economic indicators over time by World Bank income group.

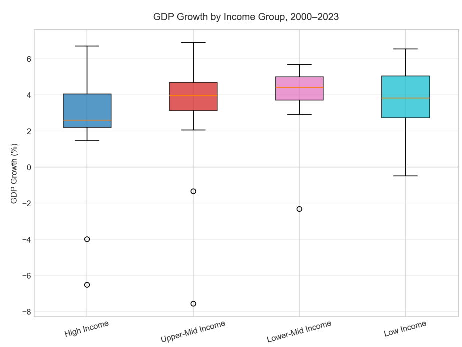

Figure 4: Distribution of annual GDP growth rates by income group, 2000–2023.

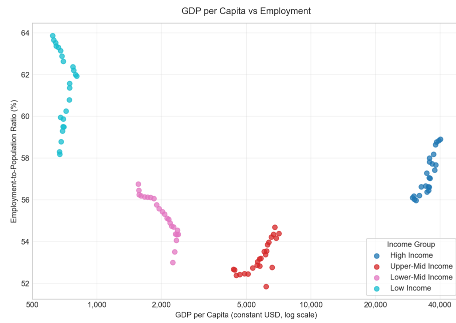

Figure 5: Relationship between GDP per capita and employment-to-population ratios by income group.

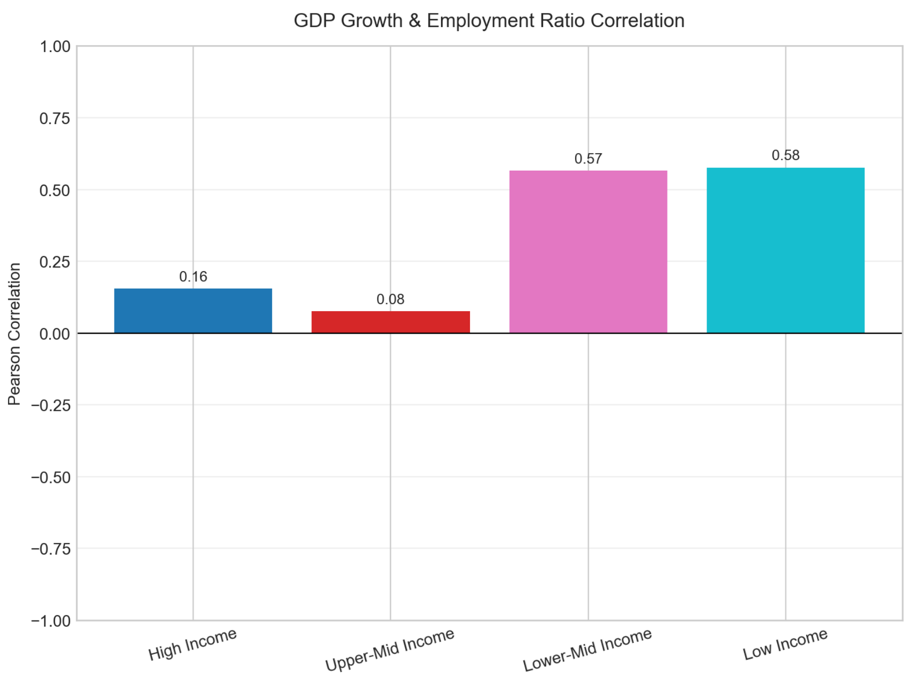

Figure 6: Correlation between GDP growth and employment-to-population ratios by income group.

Results & Discussion

Differences in Economic Outcomes Across Income Groups

Figure 1 illustrates substantial differences in average GDP per capita across World Bank income classifications over the 2000–2023 period. High-income countries exhibit by far the highest average GDP per capita, exceeding $35,000 (constant USD), while upper-middle-income countries average approximately $6,000. Lower-middle-income and low-income countries trail significantly behind, with average GDP per capita below $3,000 and $1,000 respectively. These disparities highlight persistent global inequality in income levels and economic capacity.

In contrast, employment-to-population ratios show relatively modest variation across income groups (Table 1). While low-income countries tend to exhibit slightly higher employment ratios than high-income countries, the differences are small relative to income gaps. This suggests that employment rates alone do not capture differences in economic well-being, as employment in lower-income countries may be concentrated in lower-productivity and lower-wage activities.

Global Trends in Economic Indicators Over Time

Figure 2 presents average global trends in GDP per capita, GDP growth, and employment-to-population ratios. GDP per capita increases steadily from 2000 through 2019, reflecting sustained global economic expansion. A sharp decline occurs in 2020, coinciding with the economic impacts of the COVID-19 pandemic, followed by a partial recovery in subsequent years.

GDP growth rates display greater year-to-year volatility than GDP per capita, fluctuating around 2–4% for most of the sample period. The most pronounced contraction appears in 2020, when global growth becomes strongly negative. Employment-to-population ratios remain relatively stable over time, though a noticeable decline around 2020 indicates widespread labor market disruptions during the global downturn.

Income-Group-Specific Dynamics

Disaggregating trends by income group reveals important heterogeneity (Figure 3). High-income countries consistently maintain the highest GDP per capita throughout the period, with gradual long-term growth interrupted mainly by global crises such as the 2008 financial crisis and the COVID-19 pandemic. Upper-middle-income countries experience steady growth in GDP per capita, modestly narrowing the gap with high-income economies, although substantial differences remain.

GDP growth rates across income groups follow similar cyclical patterns, suggesting that global economic shocks affect countries across development levels simultaneously. However, growth volatility is more pronounced in middle- and lower-income countries, indicating greater macroeconomic vulnerability. Employment-to-population ratios differ more visibly: low-income countries generally maintain higher employment ratios, while high-income countries exhibit lower but more stable employment levels, reflecting differences in demographics, labor market institutions, and economic structure.

Relationships Between Growth, Income, and Employment

Figure 4 summarizes the distribution of annual GDP growth rates across income groups from 2000 to 2023. Median GDP growth rates tend to be higher in middle-income countries than in high-income countries, reflecting faster growth potential in developing economies. However, growth volatility is also substantially greater for upper-middle- and lower-middle-income groups, as indicated by wider interquartile ranges and more extreme outliers. High-income countries display more stable growth patterns, consistent with stronger economic diversification and institutional resilience.

Figure 5 examines the relationship between GDP per capita and employment-to-population ratios across income groups. The scatter plot shows a clear stratification by income level: low-income countries cluster at low GDP per capita but relatively high employment rates, while high-income countries exhibit much higher income levels with more moderate employment ratios. This pattern suggests that higher employment shares in poorer countries may reflect greater reliance on informal or low-productivity labor rather than stronger labor market outcomes.

Figure 6 quantifies the relationship between GDP growth and employment using Pearson correlation coefficients by income group. The correlation is relatively weak for high-income and upper-middle-income countries, indicating that short-run economic growth is not strongly associated with employment changes. In contrast, lower-middle-income and low-income countries exhibit stronger positive correlations, suggesting that employment in these economies is more sensitive to fluctuations in economic growth and more vulnerable to macroeconomic shocks.

Interpretation and Implications

Overall, the results suggest that while global economic growth has raised GDP per capita across all income groups, convergence between low-income and high-income countries remains limited. Persistent income gaps indicate that differences in productivity, technological adoption, and capital accumulation continue to play a central role in shaping global inequality. The relative similarity of employment rates across income groups further emphasizes that productivity, rather than labor force participation, is a key determinant of economic development.

Limitations

This analysis relies on income-group averages, which mask substantial heterogeneity within groups and across individual countries. In addition, missing observations for some countries and years may affect the precision of summary statistics. Future work could extend this analysis by focusing on regional patterns or conducting country-level analyses to better understand specific development trajectories.

Conclusion

The evidence from 2000–2023 reveals a global economy characterized by gradual improvements in key development indicators, alongside persistent structural inequality across income groups. All income groups experienced gains in GDP per capita over time, yet substantial disparities remain between high- and low-income countries. GDP growth rates tend to respond similarly to major global shocks, reflecting the interconnected nature of the global economy, although lower- and middle-income countries face substantially greater volatility. Employment-to-population ratios remain relatively stable and more similar across income groups, underscoring that differences in productivity—rather than employment levels—drive much of the observed variation in economic well-being.

Moreover, the relationship analysis highlights important differences in how economic growth translates into labor market outcomes across income groups. While GDP growth and employment are only weakly correlated in high-income economies, lower-middle- and low-income countries exhibit stronger positive relationships, indicating that employment in these economies is more sensitive to macroeconomic fluctuations. This suggests that workers in poorer countries are more vulnerable to economic shocks, reinforcing the importance of policies aimed at improving economic stability and productivity growth. Overall, the findings suggest that global development has advanced, but longstanding gaps in economic capacity and resilience continue to shape uneven development trajectories across countries.