

The Effect of Population Growth on Economic Well Being

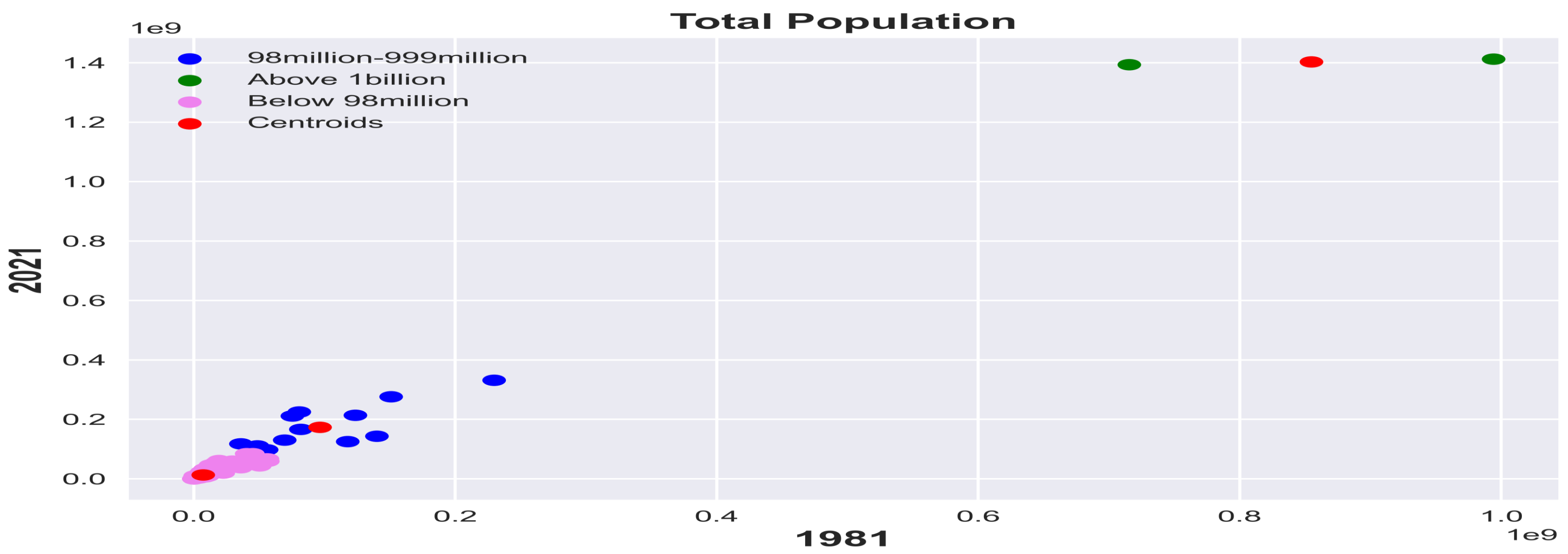
By Omoregbe Olotu

INTRODUCTION

Human population typically grows over time. However, the effects of population growth on the economy remains a controversial debate. For some countries, population growth could translate to an increased workforce that may likely spur economic growth while in some countries it could foster economic deceleration especially where there are limited resources to cater for the teeming population. As GDP per capita tells us the average economic output or income per person in a country, it is often used as an indicator of a country's overall economic well-being and standard of living. This study aims to picture the size of the GDP per capita as the population increases over time.

METHODOLOGY

- K-means Clustering was used to detect population growth patterns among countries using historical data from **World Bank**.
- Ghana, China, United States were selected from the 98million-999million, Above 1billion, and Below 98million Population size clusters respectively.
- Logistic and polynomial curve fitting models were used to forecast the Population growth and GDP per capita respectively for the selected countries.



Graph showing the clustering results and their centroids based on population size with a silhouette score of 0.85 which indicates the cluster appropriateness.

POPULATION PROJECTIONS

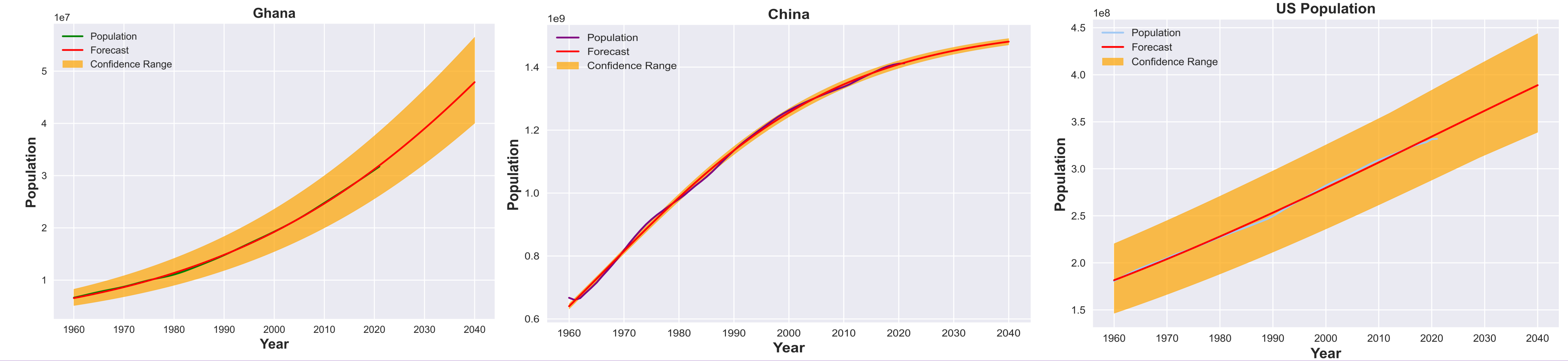


Fig. I showing a projected exponential growth rate for Ghana and USA while China’s growth rate remain logarithmic for the next two decades due to its family planning policies.

GDP PER CAPITA PROJECTIONS

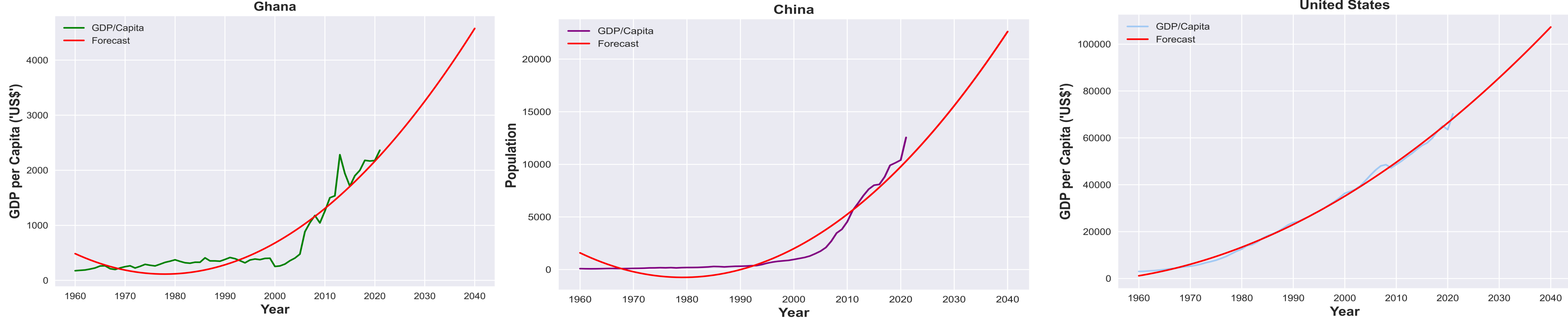


Fig. II showing an exponential GDP/Capita growth rate in the next two decades for all three countries despite the population growth suggesting a faster productivity growth.

Year	Ghana			China			USA		
	Population	GDP	GDP /Capita	Population	GDP	GDP/Capita	Population	GDP	GDP /Capita
2010	24,779,614.00	31,196,275,969.54	1,258.95	1,337,705,000.00	6,087,163,874,512.21	4,550.45	309,327,143.00	15,048,964,444,000.00	48,650.64
2020	31,072,945.00	67,632,733,831.84	2,176.58	1,411,100,000.00	14,687,673,892,882.00	10,408.67	331,501,080.00	21,060,473,613,000.00	63,530.63
*2030	38,995,851.85	126,887,595,007.94	3,253.87	1,452,324,443.96	22,608,762,783,656.00	15,567.29	361,741,677.45	30,987,161,255,757.30	85,661.02
*2040	47,877,705.39	219,027,561,059.08	4,574.73	1,481,057,865.16	33,502,405,415,908.20	22,620.59	388,877,353.24	41,720,109,370,175.30	107,283.46

TABLE 1.1 Showing the Population, GDP and GDP/Capita for 4 Decades. Note: * denotes forecasted years

GHANA

- In 2020, the decade growth rate figures for Population, GDP and GDP/Capita was 25%, 117% and 73% respectively.
- The decade growth rate for Population, GDP and GDP/Capita is expected to be 23%, 73% and 41% respectively by 2040.

CHINA

- In 2020, the decade growth rate figures for Population, GDP and GDP/Capita was 5%, 141% and 129% respectively.
- The decade growth rate for Population, GDP and GDP/Capita is expected to be 2%, 48% and 45% respectively by 2040.

UNITED STATES

- In 2020, the decade growth rate figures for Population, GDP and GDP/Capita was 7%, 40% and 31% respectively.
- The decade growth rate for Population, GDP and GDP/Capita is expected to be 8%, 35% and 25% respectively by 2040.

CONCLUSION

From the study, while other factors like technology advancement, income distribution or inflation rate may influence the general economic wellbeing, it is quite apparent that an increased population growth will most likely lead to a better economic well being when the population growth rate is slower than the growth rate of the GDP.