

**By Bill Spitz, Principal**

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Population— A Tale of Two Worlds

I have written about a wide variety of subjects over the years but this one may be the most comprehensive in that it touches economics, politics, diplomacy, sociology, ecology, and health, among many other topics. Population growth has been on the minds of writers, economists, and policy makers for hundreds of years. Jonathan Swift wrote his wonderful satire *A Modest Proposal* in 1729 recommending that the poor sell their babies as a food source for the rich in order to overcome the effects of excess population growth. On a more serious note, Thomas Malthus published a treatise in 1798 expressing concern that population grows exponentially while the supply of food grows arithmetically inevitably leading to catastrophe. China implemented the One Child Policy in 1980 due to a history of rapid population growth and famine. And, Americans and their elected officials argue incessantly about immigration.

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Current population trends can be described as a tale of two worlds. Mature, industrialized countries are generally characterized by relatively flat or declining populations due to low fertility rates, aging, and modest immigration. At the other extreme, many emerging countries are experiencing explosive growth due to high birth rates, young populations, and increasing life expectancy. In both cases, there will be a variety of economic, social, political, and environmental pressures including a large number of unpredictable and unintended consequences.

THE FUNDAMENTALS OF POPULATION GROWTH

Growth in the population of a given country is a function of two variables. The first is what is known as **natural growth** which equals the number of births less the number of deaths in a given year. The second is the level of net **immigration**. We consider each of these factors with particular emphasis on countries and regions at the extremes.

The number of births is generally measured in terms of the fertility rate which is the number of lifetime births per woman. At one extreme is Niger at 6.9 with the next thirty spots taken by other African countries whose fertility rates range from 4.1 to 6.4. By way of comparison, the world average is 2.4 and the U.S. clocks in at 1.6. At the other end of the spectrum are Hong Kong and South Korea with .87 and .78 births per woman, respectively. While these two countries are extreme, about one half of the world's population lives in countries where the fertility rate is insufficient to replace the current population. These very large differences are attributable to a variety of factors including the availability of educational and employment opportunities for women, cultural and religious norms, access to contraception, and income levels. A particularly important contributor to high fertility rates in some developing countries is a high incidence of infant mortality.

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The death or mortality rate is generally quoted in terms of deaths per year per one thousand people. Once again, the ranges are extreme. At the high end are a number of Eastern European and former Soviet Bloc Countries such as Bulgaria, Ukraine, Latvia, Lithuania, Serbia, Croatia, and Russia. Their death rates range from 12.7 to 15.4 per thousand. With death rates of 1.7 to 2.2, it is interesting that the majority of the countries with the lowest mortality rates are located in the Middle East including Qatar, United Arab Emirates, Saudi Arabia, Bahrain, Oman, and Kuwait. The U.S. falls in the middle of the global pack at 8.4. Once again, the disparity between the highs and lows raises the obvious question as to the underlying factors driving such a large gap. They include genetics, personal behavior such as smoking, the quality and accessibility of healthcare, nutrition and diet, educational levels, the availability of basic necessities such as potable water and sanitation, the presence or absence of conflict, and the overall standard of living.

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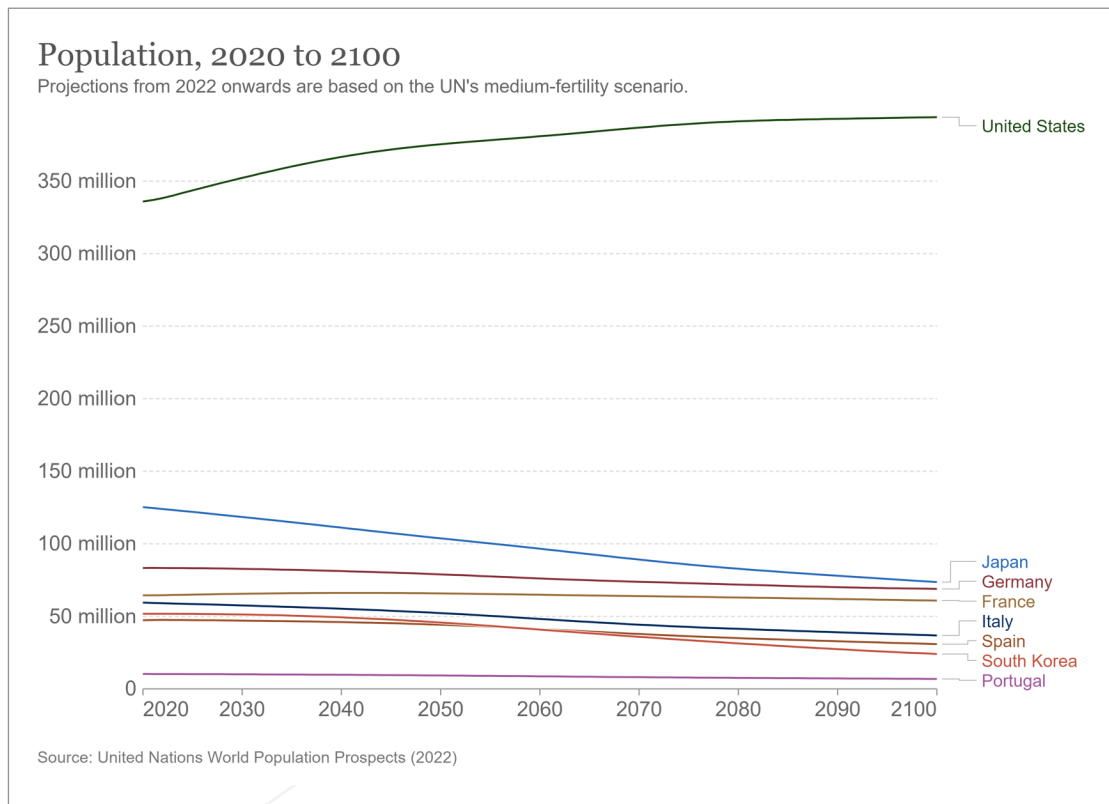
Combining birth and death rates generates the **natural** percentage change in population which once again varies tremendously across individual countries and regions. As was the case with the fertility rate, most of the top forty countries are located in Africa with growth rates over the 2015-2020 period of 2.4% to 3.8% annually. The Middle East and parts of Asia also have relatively high growth rates as characterized by 2.2% in Pakistan, 2.1% in Egypt, 1.8% in Jordan, 1.4% in Libya, and 1.2% in India. Next comes Latin America with growth rates of .6% to .9%. Another region with a healthy growth rate of .5% or so is Oceania which encompasses Australia, New Zealand, and a number of islands in the South Pacific. Some parts of Europe still enjoy modest positive growth of .15% to .4%, and the U.S. falls in that same general area at .33%. Unfortunately, there are also a number of European countries including Germany, Hungary, Portugal, Greece, and Italy that are in negative territory with growth clustered around -.3%. Other countries with serious demographic challenges are Japan (-.3%), Lithuania (-.32%), Ukraine (-.5%), and Bulgaria (-.65%). One country deserving special mention due to its size and influence is China. Between 2015 and 2020, it reported natural population growth averaging .48% per annum. However, the growth rate declined to .03% in 2021 and was likely negative in 2022.

The last piece of the puzzle is **immigration** which is best examined by dividing countries into three broad buckets based on annual immigration as a percentage of the existing population. First, with annual rates of 1.5% to 3%, immigration into Middle Eastern countries such as Qatar, Oman, Bahrain, and Kuwait is very high. This is attributable to refugees from armed conflicts in other Middle Eastern countries such as Syria, Iraq, and Yemen as well as the availability of employment in the oil-rich Persian Gulf region. At the other end of the spectrum are troubled countries such as Syria, Puerto Rico, Venezuela, South Sudan, Lithuania, and Eritrea. They unfortunately are experiencing outward migration of 1% to 3% per year due to war, disease, natural disasters, failed governments, and poverty. The third, middle of the road group, consists of most developed countries in Western Europe as well as the U.S. and Canada. This group has experienced moderate annual immigration of .3% to .7% per annum. Switzerland, Germany, and Canada are at the high end of the range with rates of .6% to .7% while the U.S. is at the low end at .29%. Due to their importance on the world stage, China and Japan should be covered separately. China experienced a net outflow of people in 2022 of .25% and Japan maintains a very restrictive immigration policy resulting in very little movement in either direction.

OVERALL POPULATION TRENDS

The combination of natural growth and immigration results in the **overall** trend in population for countries and regions. While absorbing all of the statistics presented above may have been somewhat tedious, grasping the underlying dynamics of population growth will help place the conclusions I provide in perspective. In contrast to many other data series, population forecasts tend to be relatively accurate because demographics change very slowly rendering growth rates more or less “baked in.” As a frame of reference for the data that follows, world population growth is expected to average .35% per annum between 2020 and 2100.

The best way to illustrate population trends is through a picture, so I begin with the 2020-2100 population trajectory for a number of developed, mature countries. This analysis, which is graciously provided by Visual Capitalist, is based on projections by the UN. I believe it is quite powerful and somewhat startling in that the U.S. is the only country among this group that actually enjoys population growth, albeit with a modest annual growth rate of .2%. The other countries shown are expected to experience declining populations at an annual rate of .1% to .7%. The country with the most severe trend is South Korea with an annual decline in population of .95% resulting in an estimated population in 2100 that is 54% below today's level. This is just a sampling of countries, but the picture would not change significantly with a different subset of the industrialized world.



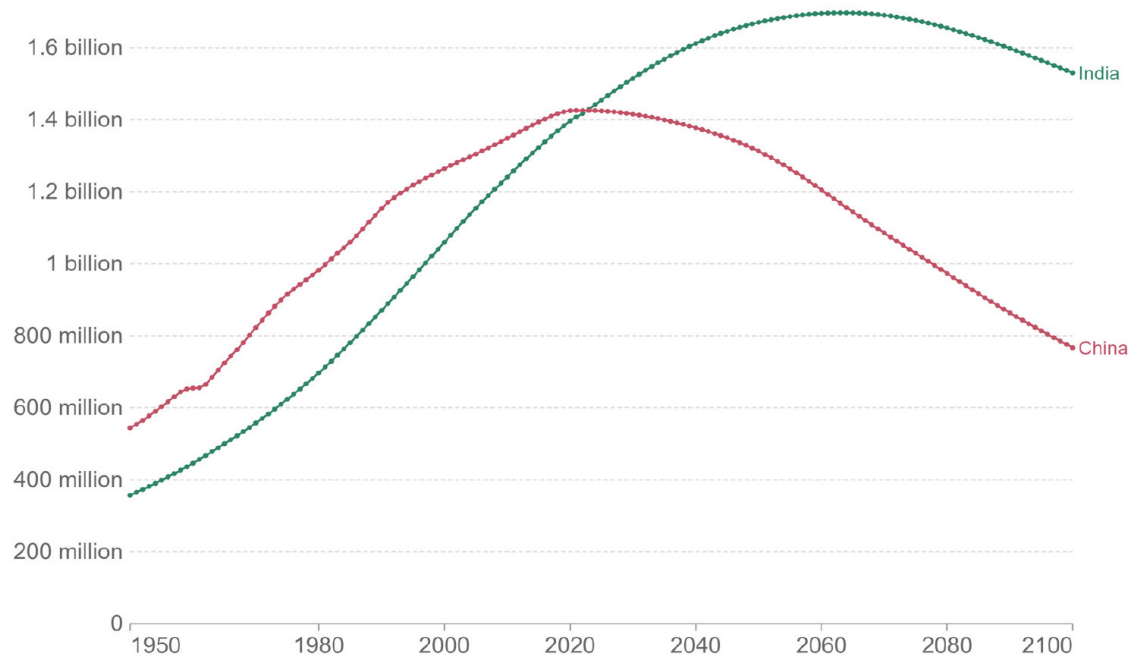
The ominous trend

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Two countries that merit a separate look are China and India. In this instance, I extended the time period covered to 1950 to 2100 in order to provide some historical perspective in addition to the UN forecasts. From 1950 to 2020, China's population grew from 543 million to 1.42 billion, an annual growth rate of 1.4%. During the same period, India grew from 357 million to 1.4 billion people, an even faster annual growth rate of approximately 2%. While all of the numbers are not available just yet, it is likely that India's population surpassed that of China in 2022. Moreover, China's population is projected to decline to 767 million by 2100, an annual rate of -.8%. After peaking in 2061, India's population declines to 1.53 billion in 2100 which still represents an annual growth rate from 2020 of about .1%. The ominous trend in China has profound implications for economics and politics as well as its role in the global community. In a stark reversal of the One Child policy, China's government recently announced a number of policy changes designed to encourage births including relaxation of the limitation on the number of children allowed and insurance coverage for fertilization treatments.

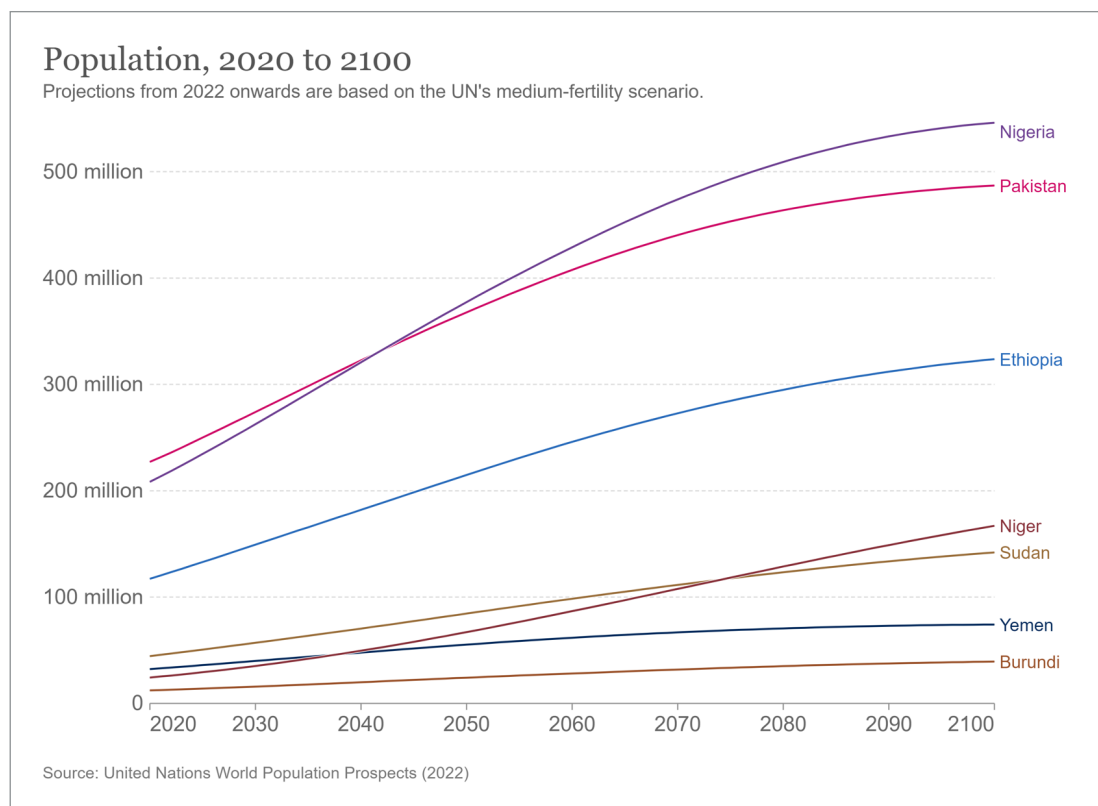
Population, 1950 to 2100

Projections from 2022 onwards are based on the UN's medium-fertility scenario.



Source: United Nations World Population Prospects (2022)

This paper is titled A Tale of Two Worlds, so I selected seven countries from Africa and the Middle East to illustrate trends in the developing world which is experiencing extraordinary population growth. As compared to the growth rates of $-.7\%$ to $.2\%$ that characterized the mature countries, the developing group is expected to grow through 2100 at annual rates of 1% to 2.4% . On the surface, those do not seem like particularly large numbers, but they result in an average population increase of 230% during this period! In 2100, Nigeria and Pakistan are expected to have larger populations than the U.S., and Ethiopia is not far behind.



POSSIBLE IMPLICATIONS

One of the lessons I have learned in my career is that issues are always more complex and nuanced than the simple solutions and sound bites that dominate contemporary society. In most cases, even the “experts” differ on their conclusions and recommendations. The impact of population growth is a particularly thorny issue on which there is moderate optimism at one extreme and dire pessimism at the other. So, I present several high level conclusions on which there seems to be general agreement, and then dig into some details on which there is less clarity and more uncertainty.

TWO HIGH LEVEL CONCLUSIONS

Economic growth is equal to the sum of growth in the working age population and growth in the output of each worker, also known as productivity growth. Therefore, given flat to declining populations in the mature countries and rapid growth in the developing countries, we should expect a material difference in their respective economic growth rates. It is possible that technology investments in the mature countries may increase productivity to the extent that some of the overall spread in growth is reduced. However, productivity gains have been very modest in the mature economies for a number of years suggesting that we should not count on them to close the gap. The following forecasts from the OECD provide a sense of the difference in expected growth rates over the 2020 to 2060 period:

Real GDP growth 2020-2060

Mature Countries	Annual Percent Change
U.S.	1.5%
Euro Area	1.1%
Japan	.5%
Korea	.6%
Developing Countries	Annual Percent Change
Bangladesh	4.8%
India	4.8%
Indonesia	3.7%
Nigeria	4.2%
Pakistan	4.4%
Vietnam	5%

China is somewhat of an anomaly because its population growth falls in the first category, but its forecasted GDP growth of about 3% is more aligned with the developing countries.

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from the mature countries to the emerging world...

The first major conclusion is that there will be a large shift in GDP from the mature countries to the emerging world as a result of these differing growth rates. To place this shift in perspective, the economies of the E7 countries (7 emerging countries including China, India, and Indonesia) were one-half the size of the G7 countries (U.S., Europe, and Japan) in terms of GDP in 1995. By 2040, the E7 countries may be twice the size of the G7 Group. One important note is that real GDP growth does not automatically translate into improved quality of life for every person, and several influential economists have recently asked whether we should be maximizing something other than growth. In any case, this shift in the relative size of various economies raises fascinating questions regarding diplomatic influence, military power, world trade, sociology, and many other “cosmic” issues. I will leave it to the think tanks to figure them out!

The second major conclusion is that large shifts in population and economies will have a meaningfully negative impact on the environment and severely strain the availability of natural resources. In particular, rapid population growth in developing countries will lead to increasing urbanization while also destroying natural habitat in order to produce sufficient food to feed the growing populations. One mitigating factor may be that advanced economies generally consume more natural resources on a per capita basis, so there is hope that the overall impact on the environment and natural resources could be reduced somewhat should developing countries be able to decouple growth from natural resource extraction.

UNDER AND OVER POPULATION

There is a point at which a lack of population growth crosses the line into underpopulation, and the same is true when rapid growth reaches the point of overpopulation. While the actual point of demarcation is unclear in both cases, the characteristics of each situation are very relevant to today’s world. **Underpopulation** may be associated with the following:

Pros

- More economic opportunities for women and minorities
- Upward pressure on wages
- A smaller contribution to climate change
- Less pressure on certain types of infrastructure such as roads

Cons

- Slower economic growth
- Burden of supporting the elderly falls on the declining working population
- Stress on the health care system
- Labor shortages
- Stressed entitlement programs
- Increasing poverty
- Need for more debt to finance health care benefits and other government programs

Whether or not any or all of these consequences will actually apply to the mature countries remains to be seen, but many of the Cons are uncomfortably familiar.

Overpopulation creates one potential pro and a long list of cons:

Pros

- Possibility of greater per capita income in the developing world which should lead to improved health, a higher living standard, and increased longevity

Cons

- Possibility that job growth does not match population growth leading to a high level of unemployment and the possibility of civil unrest, etc.
- Many countries may outstrip critical resources
- Pollution, waste, and water shortages
- Deforestation that impacts the level of carbon dioxide and eliminates many animal and plant species
- Insufficient infrastructure to manage the growing population
- Energy shortages
- Higher risk of pandemics due to urbanization with resulting densification of the population

Additionally, these negative outcomes individually or in concert may well induce outward migration from the developing world which will stress mature countries. Regional conflicts also become more likely as countries scramble for resources and deal with unwanted immigration. Unfortunately, many of these concerns are already visible in the developing world.

For better or worse, the world is going to change significantly over the next fifty years. While there are many “cons” for both mature and developing countries, the world need not be Dystopian. While strategies for addressing these issues exist, they have heretofore been largely confined to think-tanks and some international institutions. These strategies need to be evaluated, debated, and ultimately implemented by the world’s governments in order to forestall the worst outcomes. And, the clock is ticking!

THE U.S.

This paper has been devoted to major world shifts in population, but the U.S. is also experiencing profound demographic changes. I may well write a paper on this topic, but here are a few tidbits from the U.S. Census Bureau to start the discussion:

- The U.S. population is aging rapidly. In 2016, 15% of the population was age 65 or older. That number rises to 20% in 2030 and 25% in 2060.
- Immigration will contribute more to U.S population growth than the natural increase going forward.
- While the overall population will grow by 25% between 2016 and 2060, the Non-Hispanic White population will decline by almost 10%
- The African-American population will increase by 41%, the Asia population by 101%, and the Hispanic population by 94%.
- The Two or More Races category will experience the most rapid growth at 198%.
- In 2060, 32% of the population will be other than white.
- The foreign born segment will increase from 14% to 17% of the population.

“Toto, I have a feeling we’re not in Kansas anymore.”

ATLANTA

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