Demographic policy construction: Inapt use of growth rates illustrated

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September 2021

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Abstract

The use of ratios and percentages is error-prone, especially in demographic areas. This brief paper illustrates such a misuse as an academic exercise, unrevealing the entity.

Key words: Demography; Population growth; Base values

JEL: J10; J11

Demography is relatively a recent and upcoming area in economics with focus on population dynamics. Our very entry in this word and exit from it form part of population statistics. Citizen registers are maintained and updated. Population can change through changes in fertility, mortality, and migration. Sociologists, economists and politicians keep n eye of these changes. They have far reaching consequences for resource allocation, GDP growth, its content utilization and welfare promotion.

DEMOGRAHIC SCENE

| AGING TOP |
| PRESSURED MIDDLE |
| BULGING BOTTOM |

In general, these patterns are currently being influence by the aging population or the fast multiplying of the young The basic public policies on these issues can be varied in application to population subgroups. For example, the population size of ethnic groups or nationalities in a country on perceptions that may not be true, as we illustrate below.

In 1951, I had bought on reference by my learned teacher, a petite old hard cover– S*tatistics* by H. C. L. Tippets. S*tatistics* had no statistics but it made the basics of the subject sinking deep in the mind of the reader. The Chapter – *Expressing it in numbers* – dealt at length with the uses and abuses of averages ratios, and percentages. That reading has perceivably an impact on the present writing. Table 1 presents the data used for our argument.

Table1. Population in million

1951		2101	
White	Black	white	Black
30.01	3.621	319.8775	72.2895
P_{0w}	P_{0b}	P_{nw}	P_{nb}

The place is ruled by the White (W), The Black being in minority. The Whites contend that their rate of growth is slower than the Black who would eventually exceed them in number to governance. The apprehension has led the Whites initiate policies backed by legislation to block the proclivity. We propose to investigate as follows.

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1. Are Blacks indeed growing at a faster rate than the Whites, and
2. If yes, are they likely to overtake the White; when? We know that

$$P_n = P_0 (1+r)^n \quad (1)$$

If other values in the equation are known, we can follow r as follows.[1]

$$P_n = P_0(1+r)^n$$

$$(1+r)^n = \frac{P_n}{P_0}$$

Raises both sides to the power of (1/n):

$$[(1+r)^n]^{\frac{1}{n}} = \left[\frac{P_n}{P_0}\right]^{\frac{1}{n}}$$

$$1+r = \left[\frac{P_n}{P_0}\right]^{\frac{1}{n}}$$

$$r = \left[\frac{P_n}{P_0}\right]^{\frac{1}{n}} - 1$$

Then, finding r is straight forward.

Using the procedure and using the data at two time-points - 1951 and 2021 - in Table 1, we find r for W and B approximately as W = 21% and B = 26%. Thus, the contention that Blacks are growing at a faster rate than the Whites is true and the difference looks substantial.

But would that growth rate difference make Blacks eventually overtake the Whites relegating them to the second position in the land as feared? For investigation, we work a fifty years population projection onwards from 2021 using equation (2) in each case.

$$P_{2050} = P_{2021} (1 +r)^{50} \quad (2)$$

Based on Excel spread, we present relevant data at a 10 year interval in Table 2,

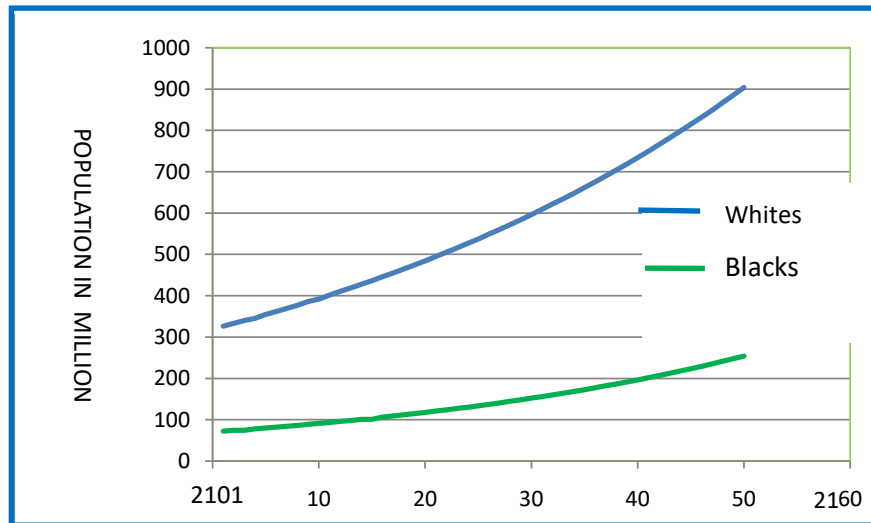Table 2 Growing excess of Whites over Blacks for the next 50 years

Community	2101	2110	2120	2130	2140	2150
Whites W	30.01	391.77	484.73	596.70	734.54	904.21
Blacks B	3.62.	91.08	120.79	152.18	196.71	254.27
W - B	26.39	300.69	363.94	444.52	537.83	649.94

The following Figure based on full data amply clarifies and helps nullify the apprehension of the Whites. Instead of narrowing down, the inter-community number

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[1] I owe this to my years long friend and colleague in Malaysia, Prof. Mansor H. Ibrahim, now the Dean & CEO of INCEIF, The Global University of Islamic Finance, Kuala Lumpur.

gap would continue widening ad infinitum in their favor despite the faster growth of the Blacks

The inter- community population gap widens for the Whites

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