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The Impact of Variation in International Migration on U.S. Population Projections

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ABSTRACT

Projections of international migration are considered to be the least certain component in U.S. population projections. Alternative series provide a means of understanding the sensitivity of population projections to different assumptions about the future levels and composition of the international migration streams. This paper examines the impact of varying immigration and emigration assumptions on U.S. population projections. It also considers the effect of varying the demographic composition of the immigration projections on the demographic make-up of the projected population. These variations in migration are not confidence intervals, rather they will allow us to demonstrate how sensitive our population projections are to changes in international migration. The various population projections produced will be examined for change in the racial and ethnic composition of the population, the timing of the majority-minority crossover, and dependency ratios.

INTRODUCTION

Population projections often include alternative assumptions regarding international migration to evaluate how sensitive they are to changes in this component. For the U.S. Census Bureau's 2012 National Projections, High and Low series of international migration projections were produced by increasing and decreasing the rates of foreign-born immigration by 30 percent. This deterministic approach is not intended to represent confidence intervals, rather it aids in our comprehension of the sensitivity of the population projections to the changes in the migration component. For example, two trends that we observed in the 2012 set of projections were changes in the rates of change in the proportion Hispanic and the old-age dependency ratios. The proportion of the population that was Hispanic increased faster in the High series than it did in the Middle or Low series. In contrast, the increase in the old-age dependency ratios slows in the High series compared to the Middle and Low series.

The Census Bureau plans to release a new series of national projections in December 2014. This paper presents methodologies and results for alternative migration scenarios, to be used in conjunction with the fertility and mortality assumptions used to produce the 2014 National Projections. These alternative series will provide a range around the main projection series scheduled for release in 2014, to address the uncertainty of the migration assumptions in our population projections and demonstrate the sensitivity of the population projections to different assumptions about the future level and composition of international migration flows.

BACKGROUND

Through the middle part of the 20th century, net international migration was low compared to earlier and later years, having little impact on population change. Therefore, the producers of population projections focused on variations in fertility and mortality to produce alternative projection series. The exception to this was the first post-World-War-II set of projections published in 1948, which included three immigration assumptions: zero immigration for a low series, an

annual level of 100,000 as a preferred series, and an annual level of 200,000 as a high series (Whelpton, Eldridge, & Siegel, 1948).

At the same time as the baby boom was ending in the mid-1960s, international migration began to increase and its influence on population change increased. Alternative assumptions for the international migration component were once again used as a tool for varying the population starting with the 1982 series (U.S. Census Bureau, 1984). This series, and subsequent projected series up to the 2000 series, selected preferred, high, and low values, which were held constant across the projection period (U.S. Census Bureau, 1989, 1992, 1993, and 1996). The 2000 series was the first created by the U.S. Census Bureau that allowed the levels of net migration to vary across the projection period (U.S. Census Bureau, 2000). The Census Bureau continued to innovate in the 2009 series where it used the ratio of the immigration estimates from its Population Estimates Program for 2001 to 2008 to the projected values for those years. The High series was created by dividing the 2008 projection by the ratio of 0.856 while a Low series was created by multiplying the 2008 projections by this ratio (U.S. Census Bureau, 2008 and 2009).

In 2012, the U.S. Census Bureau once again revised its methods for projecting international migration by projecting future rates of international migration from sending countries and applying those rates to the projected populations in those countries. High and Low series, relative to the preferred series (referred to as the Middle series), were generated by looking at moving averages of the fluctuation in rates of immigration to the United States over the last several decades. The Middle series rates were then increased and decreased by 30 percent to derive the High and Low series, respectively (U.S. Census Bureau, 2012).

This work will build on the 2012 series by using both the 30 percent adjustment introduced in 2012 and also testing a 70 percent adjustment to the rates used to project immigration. In addition, this paper will increase and decrease rates for individual regions, rather than all regions, to explore the sensitivity of the projections to changes in the origin of the immigrant flows.

Variations in immigration and changes in the projected foreign-born population will be analyzed, along with the impact these variations have on the majority-minority crossover (the year in which the non-Hispanic White population becomes less than 50 percent of the total population) and dependency ratios for the U.S. population.

DATA AND METHODS

The data for this analysis come from the 2014 National Projections. High and Low variations in the immigration projections for both the 30 and 70 percent adjustments will be developed by increasing or decreasing the rates of emigration from sending regions to the United States. The value of 30 percent was selected by analyzing the variation in the historical time series extending from 1947 to 2010 (U.S. Census Bureau, 2012). The 70 percent value was selected because it more closely reflects alternative levels of net migration used in previous projection series. Table 1 lists the alternative net migration series, for each projection series since 1948 that included alternative series based on international migration, as well as the percent difference between the Middle series and the Low and High series. The mean of the absolute values of the percent differences for the Low and High series in Table 1 was 70 percent.

Variation in the demographic composition of the population will be created by increasing or decreasing the emigration rates of sending regions differentially (i.e., increase one or more regions while leaving the remaining regions at the original level). Given the number of regions and adjustment levels that are available, there are more than 200 scenarios that could be generated. It would be impractical to create and analyze all of them, so I will limit my analysis to 12 scenarios. Table 2 shows the adjustments that are made to the regional rates to create the various scenarios. Cells with '±70%' indicate that the rates for that region will be increased or decreased by 70 percent to create High or Low scenarios for total immigration and four race/Hispanic origin groups: Non-Hispanic Black, Non-Hispanic White, Non-Hispanic Asian and Hispanics. Cells with 'NA'

indicate that the rates for that region are not altered for that scenario. The scenarios that I have selected are designed to maximize or minimize the influx of a given race/Hispanic origin group while holding the other groups constant, giving us plausible minimum and maximum proportions for each race/Hispanic origin group. This will help to demonstrate how sensitive the demographic composition of our projections are to the demographic composition of our immigration projections.

RESULTS

This paper will present results comparing the different levels of international migration developed for each series and also discuss the racial and ethnic composition of those projected flows. These alternative international migration series will also be used to generate population projections. Results from the projections, including a comparison of the changes in the projected total population, growth rates, dependency ratios, and racial and ethnic composition will be discussed.

BIBLIOGRAPHY

U.S. Census Bureau. (1984). *Projections of the Population of the United States, by Age, Sex, and Race: 1983 to 2080*. Washington, DC: U.S. Government Printing Office.

_____. (1989). *Projections of the Population of the United States, by Age, Sex, and Race:1988 to 2080*. Washington, DC: U.S. Government Printing Office.

_____. (1992). *Population Projections of the United States, by Age, Sex, Race, and Hispanic Origin: 1992 to 2050*. Washington, DC: U.S. Government Printing Office.

_____. (1993). *Population Projections of the United States, by Age, Sex, Race, and Hispanic Origin: 1993 to 2050*. Washington, DC: U.S. Government Printing Office.

_____. (1996). *Population Projections of the United States by Age, Sex, Race, and Hispanic Origin: 1995 to 2050*. Washington, DC: U.S. Government Printing Office.

_____. (2000). *Population Projections of the United States: 1999 to 2100*. Washington, DC: U.S. Government Printing Office.

_____. (2008). *United States Population Projections by Age, Sex, Race, and Hispanic Origin:*

July 1, 2000-2050. Retrieved from http://www.census.gov/population/projections/files/methodstatement.pdf

_____. (2009). *Methodology Statement for the 2009 National Projections.* Retrieved from http://www.census.gov/population/projections/files/methodstatement09.pdf

_____. (2012). *Methodology and Assumptions for the 2012 National Projections*. Retrieved from http://www.census.gov/population/projections/files/methodology/methodstatement12.pdf.

Whelpton, P., Eldridge, H. T., & Siegel, J. S. (1948). *Forecasts of the Population of the United States, 1945-1975*. Washington, DC: Government Printing Office.

Table 1. Alternative Net Migration Series by Projection Release Year

Projections Release Year	Projection Series			Percent Difference from Middle Series	
	Low	Middle	High	Low	High
1948	0	100,000	200,000	-100.0	100.0
1984	250,000	450,000	750,000	-44.4	66.7
1989	300,000	500,000	800,000	-40.0	60.0
1992	350,000	880,000	1,370,000	-60.2	55.7
1993	350,000	880,000	1,370,000	-60.2	55.7
1996	300,000	820,000	1,370,000	-63.4	67.1
2000	117,000	926,000	3,039,000	-87.4	228.2
2009*	1,757,000	2,047,000	2,384,000	-14.2	16.5
Mean of the Absolute Values of the Percent Differences				**70.0**	

*These are "Ultimate Values" since net migration was allowed to vary over time.

Source Data: U.S. Census Bureau. 2010. *Historical Summary of Population Projections.*

Table 2. Adjustments Made to Regional Emigration Rates to Create the Various Scenarios

Scenarios	Sending Region			
	Sub-Saharan Africa	Mexico/Latin America/Caribbean /S. America	Asia	Europe/Oceania/ Canada/Near East/N. Africa
Total--2012 Adjustment	±30%	±30%	±30%	±30%
Total--Average Historical Adjustment	±70%	±70%	±70%	±70%
High/Low Proportion Non-Hispanic Black	±70%	NA	NA	NA
High/Low Proportion Hispanic	NA	±70%	NA	NA
High/Low Proportion Non-Hispanic Asian	NA	NA	±70%	NA
High/Low Proportion Non-Hispanic White	NA	NA	NA	±70%