

# LAST WORD

## Can Economic Growth Survive Population Decline?

The Demographic Transition Is Causing Greying Populations, Shrinking Labor Forces, and Overall Population Decreases in Many Nations. Can Economic Growth Survive?

As you know from this chapter,  $\text{Real GDP} = \text{hours of work} \times \text{labor productivity}$ . The number of *hours of work* depends heavily, however, on the size of the working-age population. If it begins to shrink, the number of *hours of work* almost always falls. In such cases, the only way real GDP can rise is if *labor productivity* increases faster than *hours of work* decreases. The world is about to see if that can happen in countries that have populations that are greying and shrinking.

The historical background has to do with the fact that as nations industrialize, their economies shift from agriculture to industry. As that happens, fertility levels plummet because the shift to modern technology transforms children from being economically essential farm hands that can contribute to their families'



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incomes from a young age to expensive investment goods that require many years of costly schooling before they can support themselves.

As people react to this change, birthrates tend to fall quite dramatically. The key statistic is the *total fertility rate* that keeps track of the average number of births that women have during their lifetimes. To keep the population stable in modern societies, the total fertility rate must be about 2.1 births per woman per lifetime (= 1 child to replace mom, 1 child to replace dad, and 0.1 child to compensate for those people who never end up reproducing as adults).

Every rich industrial nation has now seen its total fertility rate drop below the replacement level of 2.1 births per woman per lifetime. In Japan and many eastern

European countries, the number has been so low for so long that there are no longer enough children being born each year to replace the old folks who are dying. As a result, their overall populations are shrinking.

Economists only expect that pattern to become more common and more rapid, so that by the year 2050 the majority of nations will have decreasing populations. But decades before a nation's overall population begins to decrease, it faces a situation in which the labor force shrinks while the elderly population swells.

That pattern is the result of each generation being smaller than the one before. As an example, the baby boom generation born between 1946 and 1964 is much larger than the "baby bust" generation that followed it. So as the boomers retire over the next two decades, there will be a lot of retirees as compared to working-age adults.

This trend can be quantified by the *inverse dependency ratio*, which is defined as the number of people of working age (ages 20 to 64) divided by the number of dependents (seniors over age 65 plus youths under age 20). In the United States, the inverse dependency ratio is set to fall from 1.5 people of working age per dependent in 2010 to just 1.16 people of working age per dependent in 2050. That is extremely problematic because it implies that worker productivity will have to rise dramatically just to make up for the relative decline in the number of workers as compared to dependents. If productivity doesn't keep up with the fall in the inverse dependency ratio, living standards will have to decline because

there will simply be too many nonworking consumers relative to working-age producers.

The place where this problem is likely to show up first is Social Security. There are currently 2.9 workers paying into the Social Security system for each retiree receiving Social Security benefits. But that number is set to fall to just 2.0 workers per retiree in 2030. So worker productivity would have to increase by almost a third in under 20 years just to keep up with the decline in the number of workers relative to retirees.

Economists are uncertain about whether such large productivity increases will be forthcoming. The problem is that consumption competes with investment. A society with a larger fraction of dependents is a society that is likely to devote an increasingly high fraction of total output toward consumption rather than investment. If so, productivity growth may slow considerably.

Another possible problem is that, historically, most transformative new technologies and businesses have been created by energetic young people under the age of 40. With each generation getting smaller, there will be fewer people in that age range and thus, possibly, less innovation and slower productivity growth.

Other economists are more hopeful, however. They view old people as consumers and demanders. As their numbers swell, inventors may simply switch from inventing products for young people to inventing products for old people. If so, productivity growth and living standards could keep on rising at the rates we have come to expect.