New Perspectives on Population Growth and Economic Development

Ronald Lee
Departments of Demography and Economics
University of California at Berkeley
USA

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1. Introduction and Background

It seems so obvious: Larger, more rapidly growing populations have fewer natural resources per person, less physical capital per worker, more dependents, and greater needs for new social infrastructure. Of course they must be economically worse off. These intuitions shaped the earlier studies of population and economic development such as the seminal Coale and Hoover model (1958). Later studies developed more neoclassical versions of these ideas, all showing that more rapid population growth led to lower per capita income.

But Nobel Prize economist Kuznets (1956), as well as Boserup (1965, 1981) and Simon (1981) suggested many possible positive effects of population growth, including economies of scale, acceleration of technological progress, flexible market responses to emerging shortages, induced institutional change, cheaper communication and transportation, and easier collective social investments. Kuznets examined per capita income growth and population growth rates across nations and found no correlation, which seemed inconsistent with the Coale-Hoover view. His study was replicated by many others.

Similar controversies arose for family level effects of high fertility. It seemed obvious that more children would mean lower per capita family income, less labor supplied by women, and less parental investment in the human capital of each child. But again, parents might work harder if they had more children, older children could care for younger, freeing their mother's time, and more child labor might free later born siblings

to go to school. Furthermore, it was questioned whether family planning programs had an effect on fertility in any case.

The controversy prompted several evaluations of the evidence in the 1980s, including a 1986 report from the US National Academy of Sciences. The panel was co-chaired by D. Gale Johnson and Ron Lee (myself), with Sam Preston playing a leading role. This report concluded that there was only a modest or null impact of population growth on the pace of economic development[i], while suggesting that family planning programs would raise family well-being by helping couples achieve their fertility goals. However, the macro economic benefits were unsubstantiated. Other reports reached similar conclusions (World Bank 1984; Kelley 1988). These reports reduced the interest of governments and foundations in family planning programs, and set the stage for the Cairo Conference deliberations.

So what have we have learned in the 25 years since these reassessments of the 1980s?[ii] [iii]

2. New cross national regression analyses

A. Twenty Five Years of New Data Since 1980

The same cross-national regressions that showed no effect of population growth rates for 1950 to 1980 do show an important negative impact for data after 1980, for reasons that are not clear. However, these older methods have now been improved.

B. Convergence theory

(Barro 1997) analyzes the determinants of stead state levels of per capita income in national economies, and the process by which an economy moves toward that steady state. Population growth and density are found to influence both the pace of convergence and the steady state level.

C. Increased Attention to Human Capital

In another advance, human capital was explicitly incorporated in the growth model, and cross-national empirical analysis in the convergence framework indicated larger negative effects of population growth (Mankiw, Romer and Weil 1994).

D. Age distribution and sources of change: fertility mortality

Another approach pays more explicit attention to levels and changes in fertility and mortality instead of the older focus on simple population growth rates. With this new focus, changing population age distributions across the demographic transition are also explicitly considered (Bloom and Freedman ***, Williamson and Higgins 1997, Bloom and Canning 2004, Kelley and Schmidt 2005). Fertility decline raises the support ratio for 40 to 60 years in the middle of the transition, giving a transitory boost to per capita income growth, called the (first) demographic dividend. Eventually population aging reverses these gains, but the first dividend may be made permanent if it is invested in physical capital and human capital as may have happened in East Asia (Mason 1987; Williamson and Higgins 1997; Kelley and Schmidt 1995; Bloom and Williamson; Lee et al).[iv]

3. Causality analysis in cross-national settings

Meanwhile, a new concern with “causal analysis” swept through economics, transforming empirical analysis and standards for evidence. Disillusionment with

traditional econometric methods led to a search for natural experiments (Moffit 2005). Not surprisingly, the new causal approach has plenty of problems of its own (Moffit 2005; Rosenzweig and Wolpin 2000).

Acemoglu and Johnson 2007 used a natural experiment to find that more rapid population growth led to slower per capita income growth, when the rapid growth was due to mortality decline.[v] The setup was somewhat peculiar, however (Bloom et al 2009).

Another study used national differences in abortion policy to find that lower national fertility leads to higher female labor force participation, which is then predicted to raise economic growth (Bloom et al in press).

4. Causality analysis and individual fertility and contraception

There are also many causal micro studies, because experimental situations are easier to find and richer. These studies have found similar results in both rich countries and in lower income countries. Within a country, differences and changes in local laws give women different access to contraceptives or abortion. Similarly, family planning programs may be introduced in different districts at different times in ways that are plausibly random or that can be modeled and taken into account. These program differences have been found to cause differences in the level and timing of young women's fertility which in turn cause differences in their educational attainment, occupational choice, labor force participation and earnings (Goldin and Katz 2002, Goldin 2006; Bailey 2006; Miller forthcoming; Gertler and Molyneaux 2000). Very importantly, these differences in the level and timing of women's fertility translate into differences in their children's educational attainment and future prospects.

Other researchers have used sex preferences and family sex composition to find a causal effect of fertility on female labor supply.

Long term outcomes from the Matlab experiment in Bangladesh provide some of the strongest evidence for these various points, and also show better health outcomes for both mothers and children (Joshi and Schultz 2007).

These results may seem obvious to some, but in the past their validity was clouded by questions of reverse causality, selectivity, and omitted variable bias.

So What Is the Bottom Line?

Family planning programs that subsidize contraception or provide better access to it will improve the economic and general well-being of the women or couples that use those services. That is a valuable outcome in itself, but such programs are additionally likely to raise the education of the children. The same is likely true for access to abortions. The effects are sometimes small, but the results are consistent, and they can hold even when the reduction in life time births is small. The macro consequences of these outcomes have not been studied using causal methods, but I believe they are likely to be positive although small.

Although not causal, a number of macro studies also suggest that the age distribution effects of fertility decline have important economic consequences. These studies have their critics, but many, including me, find them persuasive.

All in all, there is good reason to believe that family planning and related programs lead to lower fertility and have beneficial economic effects not only for women and couples, but also for the health and educational attainment of their children.

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[i] Reduction in capital per worker would have only small effects. Flexible behavior, institutions and policy would moderate adverse outcomes, and simulations and projections that ignored these responses would be misleadingly pessimistic. At the same time, it highlighted the impact of population growth on renewable resources as one important problem, and the impact of high fertility on human capital investment as another.

[ii] For a recent comprehensive assessment that agrees on some points and disagrees on others, see Schultz, August 2009.

[iii] Space precludes discussing endogenous growth theory which has picked up one of the themes from the earlier literature, emphasizing the key role of new ideas (technology) as fuel for continuing economic growth, and of the scale of research and development activities in generating new ideas. In this way, population growth may drive economic growth, echoing earlier themes (Jones 2002; Hall and Jones 2009). This is cutting edge theoretical work, but there is no attention to environmental constraints, and no consideration of the effect of population growth on human capital formation. Nor is it clear that there is much advantage to population growth in any single country. There is little serious empirical work supporting the conclusions of the theory.

[iv] Critics (Schultz 2009) find the estimates fragile and the treatment of age distribution changes questionable.

[v] This study used variations in causes of death interacted with biomedical advances to identify the effects. For a critique, see Bloom et al 2009.