

## **Demographic Change, Institutional Settings and Labor Supply**

**David E. Bloom**  
**David Canning**  
**Günther Fink**  
**Jocelyn E. Finlay**

A large stream of recent literature has stressed the importance of demographic dynamics in understanding economic growth. Among others, Williamson (2001), Bloom, Canning and Sevilla (2003) and Mason (2003) point out that the increasing life expectancy and declining fertility rates generally associated with the demographic transition lead to significant change in age structure as the baby boom generation works its way through the age structure. As the baby boomers reach maturity, there is a rise in the ratio of working age to dependent young population, a high ratio of workers to dependents, and a “demographic dividend”. This dividend is reversed as population aging sets in and old age dependency rates rise.

One important assumption underlying this analysis of the growth effects of the demographic transition and population aging is that age specific labor market participation rates remain unchanged, so that changes in age structure feed through automatically into changes in labor supply. In this paper, we argue that demographic changes affect participation rates for several reasons. This makes the analysis of the labor supply effects of demographic change more complex since we have to take account of induced changes to activity rates.

We investigate three mechanisms through which demography affects labor supply decisions. First, as shown by Bloom and Freeman (1987), Karenman and Neumark (1997) and Macunovich (1999) relative cohort size, or “generational crowding”, affects cohort wage rates, which may influence labor supply. Second, falling fertility rates may affect labor supply decisions, particularly female labor supply. Thirdly, individuals are living longer, healthier, lives. Longer life spans affect incentives to save and retire. Savings and retirement decision in the face of increasing life expectancy, however, are significantly influenced by retire regulations and social security incentives (Bloom and

Canning (2007)). In addition to these demographic effects we also examine the substitution and income effects of wage levels on labor supply.

In this paper, we provide a detailed analysis of the interaction between demographic change and labor supply per capita, taking account of both age structure effects and behavioral responses to changes in life expectancy, fertility, and the wage effects of generational crowding.

To determine the size and relevance of these relative effects, we construct a large panel data based on ILO data. The ILO data contains labor force participation rates based on country specific labor market surveys for an extended list of countries over the period 1950 to 2005 (the surveys are in different years in different countries creating an unbalanced panel). Participation rates are subdivided into age cohorts and gender, allowing us to clearly distinguish the effects at different stages of the working life for both men and women.

We take life expectancy and social security policies as exogenous (we construct a panel data set of social security policies for countries over time). We also treat the overall capital labor ratio and level of total factor productivity as exogenous. However we regard female labor supply and fertility as being jointly determined. We therefore take fertility rates to be endogenous and instrument them with a panel of data on abortion laws and government family planning policies. Age structure depends on current and past fertility and so is also potentially endogenous; we instrument it with lagged indicators of abortion laws and family planning policies.

We find significant effect of fertility on female labor supply in services and manufacturing. However, the response in agriculture is muted by the fact that homes and workplaces are one and the same and women working at home in rural areas are counted as employed in agriculture. We also find a significant response of activity rates of men at older ages to improvements in life expectancy, though the magnitude of the response depends on the retirement incentives in the social security system. We also find a modest

effect of generational crowding on cohort labor supply. These results indicate that the labor supply effects of demographic change are not mechanical. The initial beneficial age structure effects on labor supply of falling fertility rates are magnified by the increased female labor market participation in manufacturing and services. On the other hand, the negative effect of population aging and labor supply can be offset by the effects of improved health and the increased life spans of the elderly if social security incentives for early retirement are not too great.

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