A New Model for Projecting the Demographic Dividend

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Significance/background

There has been increasing interest in the economic benefits of attaining the demographic dividend in developing countries, especially countries in sub-Saharan Africa. With its clear ties to economic growth, the dividend has consolidated interest in population issues among policymakers whose priorities lie outside the health realm. However, policymakers often assume that the dividend's economic benefits will accrue for their countries automatically. While the potential economic benefits of the dividend and the policies required to achieve it have been well-documented at the global level, no universally applicable model exists to project the demographic dividend in individual countries. The dividend can contribute to both national development and improved well-being for families and communities, but its success relies on integrated programming to promote population change through increased access to and use of family planning and to invest in human capital and economic development.

Main questions/hypothesis

This study aims to develop an empirically sound projection model that can be readily applied in any high-fertility country using national data on standard economic, demographic, and social indicators to estimate the effects of a future demographic dividend on national development. The central hypothesis is that appropriate socio-economic policies must be implemented in order to convert the demographic "opportunity" brought on by changes in the age structure to a demographic "dividend" that results in improved economic and development outcomes.

Methodology

A team from the USAID-funded Health Policy Project developed a demographic-economic model that allows for feedback between demographic changes and the economy, with an emphasis on the labor market. A series of econometric equations were estimated from international cross-sectional data, describing investment, employment, and gross domestic product (GDP), using employment, capital, and demographic parameters as a basis for predictors. We also included policy variables from a variety of sectors, including education, health, finance, and governance, as well as variables describing national infrastructure. The demographic component of the model builds off a previous Futures Group model (RAPIDWomen) that predicts levels of contraceptive use and other proximate determinants, as well as total fertility. Population projections are fed into the demographic component linked to the model.

Data were taken from standard international sources, including the World Economic Forum, the World Bank, International Labor Organization, and United Nations Population Division. All data were log transformed prior to analysis. The model was prepared using the STATA 12 statistical software package.

Results/key findings

The outcome of this study is a new modeling tool to estimate the potential economic benefit for any high-fertility country of a change in age structure brought on by increased access to and use of family planning, combined with other investments and policy changes.

Results quantify the range of benefits that can accrue from a combination of social and economic policies that are required to open the demographic window of opportunity and reap the economic and development benefits of the dividend. These include investments in health and education; improved national infrastructure; and governance, policies, and institutions that promote a sound macro-economic environment and stable financial sector. The model projects how these policy investments, together with population change promoted by increased access to and use of family planning, can contribute to growth in income per capita in a way that either policy scenario alone could not achieve.

Table 1. Econometric Equation Results

Dependent Variables	**Significant Independent Variables**
INVESTMENT	
Gross Domestic Capital Formation	Gross Domestic Product Per Capita***
	Ratio of > 15 Population to Total Population***
	Financial Market Efficiency Index***
EMPLOYMENT	
Change in Working Age Employment	Change in Working Age to Total Population Ratio ***
	Change in GDP ***
	Labor Market Flexibility Index **
GROSS DOMESTIC PRODUCT	
Gross Domestic Product	Capital Stock ***
	Employment ***
	Communication Infrastructure Index ***
	Health Index *
	Higher Education and Training Index **

*** $p<0.05$, ** $p<0.1$, * $p<0.15$

In the investment equation, we found highly significant positive coefficients for GDP per capita, age structure, and financial market efficiency on the formation of new capital. In the employment equation, we found age structure, GDP size, and flexibility of the labor market to positively and significantly affect the generation of new employment. Finally, our estimation of GDP found that in addition to capital and employment, several policy variables had a positive and significant effect. These included communications infrastructure, health, and higher education/training. The relationship found for each of these variables reinforces the existing literature on the demographic dividend.

Knowledge contribution

The model clearly demonstrates how the benefits of investments in family planning programs can be enhanced by other development initiatives in youth employment, education, governance, infrastructure, macroeconomic management, and health. This model offers a technically sound and readily understood tool that shows the interconnections between demographic and other socio-economic policies that can result in the achievement of the demographic dividend.