

WHICH POLICIES PROMOTE A DEMOGRAPHIC DIVIDEND? AN EVIDENCE REVIEW

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Key Messages



Rigorous evidence of the contribution of specific policy interventions is limited.



Improving health and education may stimulate age structure change and enhance labor productivity.



Policies promoting an open and stable economy significantly contribute to attainment of the demographic dividend.



Analyses of the contribution of **specific policy interventions to enhance good governance** to attainment of the demographic dividend are limited.



Investments in family planning stimulate the fertility decline required for age structure change and can also contribute to increased female labor force participation and economic growth.

The demographic dividend—the prospect for accelerated economic growth driven by a country's maturing age structure—has captivated the attention of policymakers around the world.

The African Union declared 2017 the year of “Harnessing the Demographic Dividend Through Investments in Youth,” and heads of state around the continent have committed to achieving the benefits of the demographic dividend through an array of supportive policies.¹

With growing enthusiasm for the potential benefits of the dividend, policymakers in many high-fertility countries are seeking guidance on specific actions that will help their countries achieve a dividend. In response, regional and country-specific roadmaps have been developed, outlining multisectoral approaches to realize a demographic dividend. However, many such roadmaps are broad-ranging and non-specific, often incorporating dozens of policy recommendations. Countries are increasingly looking for specific, in-depth guidance on policy priorities.

The importance of improvements in health, education, the macroeconomic environment, and good governance for attaining the demographic dividend is well-documented in the literature. Less well-documented are the *specific* policy investments that enabled countries to achieve those improvements and capture the dividend. The relative contributions of those policy investments in resource-constrained environments where tradeoffs between investments may be necessary have not yet been defined.

This review aims to address these gaps by assessing the literature on specific policy interventions across sectors that explicitly contribute to achieving a demographic dividend. Our goal was to provide guidance to countries seeking to prioritize interventions with the greatest impact, thus improving the effectiveness of policy planning and roadmaps aimed at attaining the demographic dividend. However, our findings suggest that evidence quantifying the contribution of various policy interventions to attain the demographic dividend is limited—at least when utilizing strict search criteria that define a demographic dividend according to existing scholarship.

Our review does identify a few policy priorities that are grounded in evidence, some of which promote the demographic transition that is required to attain a favorable age structure, while others help countries capitalize on and convert a favorable age structure into an economic boost (see Box 1). However, it is clear that more research is needed. Further efforts to assess the impact of specific policy changes in countries that successfully achieved a demographic dividend will enable decisionmakers in high-fertility countries to identify and prioritize discrete policy and program investments that improve their own countries' likelihood of attaining the dividend.

BOX 1

Dependency and the Demographic Transition

Population age structure, or the share of the population in key age groups, has important social and economic implications and can influence national policy agendas. Age structures are often examined through the **dependency ratio**, which measures the size of the working-age population (frequently defined as ages 15 to 64) relative to the size of the non-working age, or dependent, population. The dependency ratio construct assumes that the income generated by the working-age population supports those who are economically dependent, such as children and seniors.

The **demographic transition** is the long-term shift in birth and death rates from high to low levels in a population. The transition begins with mortality decline while fertility remains high, resulting in rapid population growth during the early transition period. Once fertility begins to

Methodology

We conducted a thorough scan of open access sources to identify peer-reviewed publications that explicitly linked policy interventions, within any sector, to attainment or failure to attain economic growth in the context of age structure change. Due to the small number of results, we expanded our inclusion criteria.

SEARCH PROTOCOL

We conducted the literature review by utilizing multiple search engines, platforms, and research databases, including: Gates Institute Demographic Dividend Library, Google Scholar, *Journal of Economic Literature*, *Journal of Economic Perspectives*, JSTOR, National Transfer Accounts publication library, and PubMed. The search utilized combinations of the key words—"demographic dividend," "age structure," "demographic transition," "economic growth," "GDP," and "policy"—to identify publications published between 1995 and 2018. While many of our results derived from demographic literature, we did not conduct the search with any reference to specific policy sectors or interventions. While searches using the term, "fertility decline," were considered and even tested, we chose to restrict the search to literature focused on age structure, as previous research confirms that the demographic dividend is based on changes in relative proportions of the population, not on fertility decline.

INCLUSION CRITERIA

Inclusion criteria were defined narrowly to identify retrospective studies that link **specific policy interventions** to economic growth in the context of **age structure change**. In the context of this analysis, we define policy interventions as actions that a government may take, such as promulgating a law, strategy,

decline substantially across the population and there are fewer births each year, a country's young, economically dependent population shrinks relative to the population of working-age adults. With fewer young people to support, countries experience a window of opportunity to attain the demographic dividend. The United Nations Population Division estimates that the window of opportunity for a demographic dividend opens when the share of the population under age 15 falls below 30 percent.¹

In 2015, every country that had reached this threshold had a fertility rate at or below three children per woman.²

1 United Nations Population Division, Department of Economic and Social Affairs, "World Population to 2300," (2004), accessed at www.un.org/en/development/desa/population/publications/pdf/trends/WorldPop2300final.pdf, on Sept. 14, 2019.

2 United Nations Population Division, *World Population Prospects 2017* (2017).

Evidence-Based Policies That Promote a Demographic Dividend

- Legalize contraception.
- Create a dedicated population and policy planning institution.
- Establish family planning service delivery and outreach.
- Invest in disease prevention and public health.
- Offer free public education.
- Provide inclusive access to financial services.
- Reinvest gross domestic product (GDP) growth in the working-age population.
- Develop open trade and pro-industrial policies.
- Encourage foreign direct investment.
- Create stable and secure administrative systems.

or guidelines, allocating funding, or implementing a program. Papers examining interventions that may have contributed to economic growth while not explicitly assessing the impact *in the context of age structure change* are not included in this report. Therefore, papers examining the effect of fertility decline or population growth on economic growth, rather than age structure change, are excluded. Papers applying prospective models to project potential attainment of the demographic dividend are also excluded. Our review focused on the literature around policy interventions that support or inhibit attainment of the “first dividend” (see Box 2). We also limited the review to papers focused on macroeconomic outcomes.

We planned to limit this review to studies that **quantify** the contribution of specific policies to economic growth in the context of age structure change, as well as policies that prevented countries with a favorable age structure from achieving the economic gains of a dividend. However, the number of studies attempting such a quantification was limited. Our search yielded only six studies meeting these criteria and published since 1995. In response, we expanded the literature review to include peer-reviewed policy assessments that explicitly **analyze**—not merely propose or suggest—the contribution of policy interventions to a demographic dividend in the country or setting discussed in the paper, *even if their impact on economic growth was not quantified*. This expanded

our pool of studies to 10. Studies meeting the inclusion criteria are summarized in the Annex.

Many papers, including seminal papers on the demographic dividend such as Bloom et al. (2010), do measure the contribution of policy variables (such as fertility decline or years of schooling) to attainment of the demographic dividend, but do not quantify or assess the impact of specific **policy interventions** on those variables.² Papers that do not define or describe the underlying policy changes that influenced such policy variables in the geographies under analysis are not included in this review.

STRUCTURE OF THE REVIEW

Theoretical frameworks for attaining the demographic dividend often emphasize that changes in population age structure must be accompanied by strategic investments in four areas—**health, education, economic policy, and governance**—for the potential boost to economic growth to be realized.³ The conceptual guidance of such models aligns with themes that emerged in this evidence review. As a result, though it did not guide the search or selection of papers during the literature review process, this broad framework of the demographic dividend is the structure we use to present the findings of this analysis.

BOX 2

The First and Second Demographic Dividends

The first demographic dividend becomes possible as fertility declines and the proportion of a country’s working-age population grows faster than elderly and very young dependent populations, opening up a window of opportunity for accelerated economic growth. After several decades of reduced fertility, this demographic transition will result in an aging population. If a favorable policy environment is in place, population aging can also generate a second dividend. If a productive workforce

prepares for longer life through increased savings and investments, national incomes can rise further, and countries may attain a second dividend even greater than the first.¹

1 Ronald Lee and Andrew Mason, “What is the Demographic Dividend?” *Finance and Development* 43, no. 3 (2006); Elizabeth Leahy Madsen, “For Fast-Growing Countries, Should Aging Be a Concern? Planning for the Second Demographic Dividend,” *New Security Beat* (Sept. 10, 2013), accessed at: www.newsecuritybeat.org/2013/09/fast-growing-countries-aging-concern-planning-demographic-dividend/, on Sept. 14, 2019.

Policies to Promote the Demographic Dividend: Findings From the Literature

Key Message 1: Investments in family planning stimulate the fertility decline required for age structure change and can also contribute to increased female labor force participation and economic growth.

Four studies meeting the inclusion criteria examined the contributions of policy interventions that enable women and couples to choose the number, timing, and spacing of their children to attainment of the demographic dividend. **These studies suggest interventions that stimulate fertility decline can help countries attain the dividend by accelerating age structure change and contributing to increased female labor force participation.**

Two studies quantify the contribution of policy interventions designed to influence fertility to attainment of the demographic dividend. Bloom and Canning (2003) examined the relative contribution of several policy interventions to the demographic dividend in Ireland. They found that the **legalization of contraception** in 1979 contributed to economic growth through both the mechanical effect of age structure change (see Box 3) and by contributing to increased female labor force participation. In the decades following legalization of contraception, the growth rate of per capita income increased from 3.5 percent yearly (1960 to 1980) to 5.8 percent yearly (1990s). The authors found that by 1995, age structure change was the largest driver of income growth, comprising nearly three percentage points, or approximately one-half, of total annual growth.⁴

In a separate analysis, Bloom et al. (2009) examined the relationship between policies influencing women's fertility choices and female labor force participation in a panel of

97 countries. The authors estimated that, across countries, women's tenure in the labor force is reduced by an average of 1.9 years per woman for every one child increase in the total fertility rate. The analysis suggests that over the course of the demographic transition, a four-child reduction of the total fertility rate is associated with an 18-percentage-point increase in the female labor supply, ultimately leading to an estimated 7 percent increase in income per capita.⁵

Two qualitative policy assessments also met the inclusion criteria. An Inoue (2001) policy assessment in *Population Policies and Programs in East Asia* makes the case that, as in the case of Ireland, the Government of Japan's removal of legal barriers to contraception in 1947 enabled couples to have fewer children following the post-World War II fertility boom.⁶ Inoue asserts that the resulting decline in the child dependency ratio stimulated rapid economic growth, but that this period passed quickly in Japan, suggesting that "if a nation's economy fails to benefit from [the demographic bonus], it soon must face... a demographic handicap."⁷

In the same volume of essays, Pasay and Wongkaren (2001) argue that the creation of a **dedicated population policy and planning institution**, Indonesia's State Ministry on Population and the National Family Planning Coordinating Board, facilitated successful integration of population issues and services into broader development planning, including Indonesia's first Five-Year Development Plan (Replita I). Following the implementation strategy in Replita 1 (1969-1974), II (1974-1979), and III (1979-1984), Indonesia initially focused on **family planning service delivery and outreach** to the most populous islands and communities, then expanded to harder-to-reach communities in coastal and remote areas. Ultimately, these policy and program investments produced

BOX 3

Age Structure Change and Economic Growth: The Mechanical Effect

Age structure change is the first required step in the pathway toward achieving the potential benefits of the demographic dividend. The contribution of age structure change to GDP growth and income per capita through a purely mechanical effect is well-documented in the demographic dividend literature.¹ When fertility falls, the size of the working-age population increases relative to the population of young and old dependents. Assuming new entrants can find gainful employment in the labor market and all else remains equal, the shift towards a

larger proportion of the population in the working ages will automatically lead to increases in production and income per capita. While the existence of this mechanical effect is well-documented in the literature, consensus on the length, magnitude, and causal pathway of the mechanical dividend remains elusive, belied by both methodological differences in how the dividend is measured and conceptual differences on the underlying assumptions about the mechanisms that drive fertility decline (for example, the relative importance of contraception and girls' education).

1 David E. Bloom, David Canning, and Jaypee Sevilla, *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change* (Santa Monica, CA: RAND, 2003); David E. Bloom and J.G. Williamson, "Demographic Transitions and Economic Miracles in Emerging Asia," *World Bank Economic Review* 12, no. 3 (1998): 419-455; David E. Bloom et al., "The Contribution of Population Health and Demographic Change to Economic Growth in China and India," *Journal of Comparative Economics* 38, no. 1 (2010): 17-33; Jesús Crespo Cuaresma, Wolfgang Lutz, and Warren Sanderson, "Is the Demographic Dividend an Education Dividend?" *Demography* 51, no. 1 (2014): 299-315; David E. Bloom and Jeffrey D. Sachs, "Geography, Demography, and Economic Growth in Africa," *Brookings Papers on Economic Activity* 2 (1998): 207-295.

widespread knowledge and use of contraceptives and a shift to smaller families.⁸

These studies are consistent with literature demonstrating that policy commitment and program investments to expand access to voluntary family planning information and services can help prompt fertility decline in high fertility countries.⁹ In turn, the resulting fertility decline produces changes in population age structure that contribute to economic growth through the mechanical effect described above.

Key Message 2: Improving health and education may stimulate age structure change and enhance labor productivity.

We found just one paper meeting the inclusion criteria that quantified the contribution of health policy interventions to the demographic dividend. Bloom et al. (2010) quantified the contributions of increased life expectancy to economic growth *in the context of age structure change* in China and India, finding that increased life expectancy was the biggest driver of higher growth rates in both countries. While policy interventions to improve life expectancy in India were not discussed, the authors attribute gains in life expectancy in China to government **investments in disease prevention and public health systems.**¹⁰

In a qualitative assessment of health policy interventions, McNicoll (2006) argued that investments in preventive health measures, including family planning and immunization services, in seven countries known as the East Asian tigers, were an impetus for fertility decline, thereby contributing to attainment of the demographic dividend.¹¹ McNicoll notes that all seven countries invested in building systems that expanded access to health care across the country, including in remote villages.

These limited findings suggest that further research quantifying the contribution of policies that improve population health to attainment of the demographic dividend is needed. Though not discussed in this review, research suggests that improvements in child survival often play a key role in stimulating fertility decline, as couples choose to have smaller families when each child has a better chance of surviving. As indicated by the demographic literature, this fertility decline will, in turn, contribute to the mechanical effect of age structure change on economic growth. Similarly, the strong, positive association between population health and economic growth across and within countries is well established in the literature; however, the bidirectional causality between health and wealth has produced an extensive debate on which comes first.¹² We assessed several studies suggesting a small, but positive, effect of improved health on economic growth in the context of age structure change, but they do not address underlying policy interventions and are therefore excluded from this review.¹³

While many studies of the demographic dividend include variables measuring education, most do not make reference to related policy interventions. Bloom and Canning (2003), discussed above, did not find a significant association between average years of school of the workforce and income per capita in Ireland. However, they highlighted the role of **free public education** beginning in the 1960s, which

led to increased school enrollment. They argued that “the resultant high levels of education, combined with export-oriented economic policies, seem to be powerful factors in ensuring that the benefits of the demographic transition are realised.”¹⁴

Peer-reviewed policy assessments linking investments in education and the demographic dividend are likewise limited. Ssewamala (2015) suggested that education can both shift the labor force from informal to formal employment and increase competitiveness in global markets.¹⁵ Using examples from the Middle East and Africa, the author argued that countries with an undereducated or unskilled workforce will not be able to realize the demographic dividend. Ssewamala posited that innovative methods to reduce the costs of education and **strengthen financial inclusion** for low-income populations will enhance countries’ capacity to attain the demographic dividend by increasing educational attainment and creating a productive workforce well-prepared for higher-skilled industries.

Several studies that measure the relationship between education and the demographic dividend without reference to underlying policy interventions, including some discussed in this report, have produced mixed results on the contribution of improved education to the demographic dividend. Mixed results may arise in part from methodological differences in modeling approaches, such as treating education as an explanatory variable versus as a control variable. While results generated in some papers suggest that improvements in education have a relatively small impact on attainment of the dividend, other researchers using alternate methodological approaches argue that education may be equally or more important than age structure change.¹⁶ It is also important to consider that the endogenous relationship between fertility and girls’ education may mask the contribution of education to the mechanical effect of age structure change because fertility rates are lower among women with more education (see Box 4, page 6).

Some studies measure the overall impact of human capital development on economic growth. **These studies emphasize that economic benefits of the mechanical effect must be at least partially reinvested in the human capital of future workers to maximize the dividend**, rather than purely channeled to support those who are working and have aged out of work. Lee and Mason (2010) examined the impact of investment in human capital development in the context of fertility decline in 19 countries.¹⁷ They showed that declines in fertility initially lead to sharp increases in gross national product (GNP) per capita, through the mechanical effect of increasing the ratio of the working to non-working population. However, without **reinvesting GDP growth in the working-age population**, this brief first dividend tapers out within one generation. In such settings, the dividend ultimately reverses into a negative effect on GNP per capita as a relatively low-productivity population ages. In contrast, if investments in human capital are made while fertility declines, GNP per capita eventually stabilizes at around 40 percent above its pre-fertility transition level, allowing “the first dividend to be converted into a second dividend.”

Reinforcing this finding, Queiroz, Turra, and Perez (2006) found that Brazil was unable to fully capitalize on its demographic transition due to its policy environment.¹⁸ Although the large working-age population was initially a boon to Brazil's economic growth, rather than invest those returns in human capital development, policies channeled them to the national transfer system, upon which a large elderly population continues to draw. The authors argue that this distribution of resources ultimately suppressed the magnitude of Brazil's demographic dividend.

Key Message 3: Policies promoting an open and stable economy significantly contribute to attainment of the demographic dividend.

Analyses of the impact of the economic policy within the context of age structure change are limited in number and focus almost exclusively on the influence of openness to

trade and foreign investment but do consistently identify positive effects. Bloom and Sachs (1998) argued that lack of openness to international trade hindered African growth between the period of independence and the late 1990s. Using data from 77 countries around the globe, their analysis found that closed economic policies account for 32 percent of the growth gap in Africa compared to East Asia, where many countries had **open trade and pro-industrial policies** that promoted manufacturing and exports, and less dependence on agricultural commodities.¹⁹ Similarly, in their cross-country model of economic growth, Bloom et. al. (2010) found that increased openness to trade was one of two factors that contributed to economic growth in China and India (the other was improved life expectancy).²⁰ The authors note that both countries instituted economic reforms that attracted foreign investment and increased international trade. Bloom and Canning (2003) noted that policies in Ireland **encouraging foreign direct investments** and promoting exports were well-timed with policies that reduced cost barriers to education and enabled contraceptive uptake.²¹ These policies positioned Ireland to benefit from age structure change, ultimately yielding a dividend.

As with other sectors, these findings are consistent with a robust literature documenting the impact of policy interventions that promote foreign trade and investment on economic growth. However, very few such studies incorporate age structure change in their analysis. Greater effort to quantify the combined effect of age structure change and economic policy interventions is needed.

Key Message 4: Analyses of the contribution of specific policy interventions to enhance good governance to attainment of the demographic dividend are limited.

No papers quantifying the effect of policy interventions to enhance good governance on attainment of the demographic dividend were found. However, McNicoll's policy review (2006) argues that improvements in the **stability and security of administrative systems** contributed to attainment of the demographic dividend in the seven East Asian miracle countries.²²

McNicoll's argument is consistent with studies that measure factors contributing to attainment of the demographic dividend while not accounting for specific policy interventions. In a model assessing the contribution of various explanatory variables to economic growth as age structure changes, Bloom and Sachs (1998) included a composite variable summarizing quality of institutions, which included rule of law, quality of bureaucracy, corruption, property rights, and contract regulation, and found a significant and positive association with growth.²³ Bloom and Canning (2003) also included a variable for institutional quality in their model, and likewise detected a positive and significant association.²⁴ Further research to document the contribution of specific policy interventions to enhance good governance to attainment of the demographic dividend is warranted.

BOX 4

Family Planning and Girls' Education

Attempts to quantify the impact of demographic dividend-related policy interventions are often challenged by the dynamic relationship between various policy and behavioral drivers of age structure change and economic growth. The relationship between family planning, girls' education, and fertility decline is a key example. Girls' education has a known bidirectional association with contraceptive uptake and reduced fertility. Secondary education, in particular, has transformative health and economic benefits for girls, including delaying age at first marriage and age at first birth. Therefore, educational outcomes and reproductive health/age structure outcomes are not mutually exclusive and separating the impact of these interventions in the literature is challenging.

Education also acts as a potential driver of increased workforce size and productivity, as women with secondary or tertiary education are more likely to participate in the formal labor market and can expect to earn more compared to women with primary or no education. There is broad global commitment to closing gender gaps in education, and data reflect substantial progress. In most regions of the world, the gender enrollment ratio in secondary education is equitable or favors girls; in the Middle East and North Africa and sub-Saharan Africa, girls continue to face moderate inequity in secondary enrollment, at ratios of 0.94 and 0.88 respectively relative to boys.

Source: Q. Wodon et al., *Missed Opportunities: The High Cost of Not Educating Girls* (Washington, DC: World Bank, 2018); and World Bank, World Development Indicators, accessed at <https://databank.worldbank.org>, on Oct. 11, 2019.

Key Message 5: Rigorous evidence of the contribution of specific policy interventions is limited.

The literature quantifying the contribution of *specific* policies to the overall dividend is limited. Even among the few studies that quantify the contribution of age structure changes to economic growth, only three assess specific policies that led to age structure change. Even fewer studies attempt to quantify the impact of policy approaches that were intentionally or simply contextually adopted to capitalize on age structure transition and thus maximize the potential economic benefits, such as expanding access to education. This area is important for further study, as policymakers continue to seek evidence-based recommendations around specific policy interventions to adopt as their countries approach and move through the demographic window of opportunity.

There is an expansive gray literature on the demographic dividend that this review does not examine in depth. Notably, many strategy and policy documents to help countries attain the demographic dividend are rooted in this gray literature. Some interventions identified in the gray literature are supported by the peer-reviewed papers included in our review, but not all. The gray literature generally emphasizes investments in human capital (health and education), good governance, and supportive economic policies, thereby providing a general policy framework for attainment of the demographic dividend.²⁵ Much of the gray literature describes how health programs can improve child survival, thereby lowering fertility and contributing to population age structure change. Some papers in the gray literature make policy recommendations to reduce fertility through public health investments and education policies.²⁶

National and regional roadmaps on the demographic dividend informed by the gray literature are often based on a common framework, pairing fertility decline with strategic investments in health, education, employment, and governance. The African Union (AU) Commission's *AU Roadmap on Harnessing the Demographic Dividend Through Investments in Youth* and national demographic dividend roadmaps for Kenya and Uganda also include the broad policy recommendations that were supported by this review.²⁷ For example, these roadmaps discuss interventions to improve access to family planning and reproductive health services, improve child survival and strengthen health care systems, diversify economic sectors away from agriculture and improve employment rates, attract foreign investment, and improve educational attainment, especially among girls.

The AU Roadmap and Uganda's *Demographic Dividend Roadmap* recognize fertility decline as a necessary step toward attaining a demographic dividend, which is supported by the literature. In contrast, *Kenya's Demographic Dividend Roadmap* does not specifically discuss age structure, but names areas of investment in line with the pillars in the AU Roadmap: health and wellbeing; education and skills development; employment and entrepreneurship; and rights, governance, and youth empowerment. In some instances, the actions outlined in the roadmaps list targets, but do not name specific policy interventions. Finally, these roadmaps highlight

policy interventions whose contributions to economic growth were not quantified in the papers in our review, including improved governance and youth civic participation.

As economic models are updated and more research examines policy interventions across a range of sectors, national decisionmakers and policymakers will have an opportunity to update and strengthen their roadmaps accordingly, with enhanced understanding of specific policy interventions that contribute to the demographic dividend.

Recommendations

As countries continue to develop demographic dividend roadmaps and incorporate the demographic dividend into national development and vision strategies, it is important to continue to build and clearly articulate the evidence base for policy recommendations.

Recommendations based on this review of the evidence include:

- **Investments in voluntary family planning remain the cornerstone of efforts to attain the demographic dividend.** Evidence around the contribution of fertility decline to the demographic dividend through the mechanical effect on age structure change is reinforced by the literature examined in this review, which finds a positive effect of policies and programs that enable couples to plan the timing and spacing of their families.
- **An economy open to trade and foreign investment is key to capitalize on demographic change.** While evidence around the contribution of economic policies to the demographic dividend is limited, the literature consistently indicates that policies which open the economy to foreign trade and investment contribute to economic growth in the context of age structure change. An extensive body of literature in the field of economics provides guidance on specific policy strategies to accomplish growth and development goals, but further research on the relative impact of those policy choices *in the context of age structure change* is warranted.
- **Despite limited evidence, policy interventions that improve health, advance educational attainment, and ensure early dividend returns are reinvested toward the workforce are likely to be beneficial.** While research analyzing the effect of policy choices in the context of age structure change is scant, investments that increase life expectancy, boost school enrollment, and expand access to financial services can promote higher productivity among the workforce. Further, to ensure that the benefits of the mechanical effect last beyond a single generation, it is key for returns to growth to be reinvested in building the human capital of current and future workers—not channeled toward retirees.

Although not explicitly discussed in the literature, the intersection of fertility, girls' education, and female labor force participation underscores that investment in women and girls must be at the center of efforts to attain the demographic

dividend. Recognition of the critical contributions of women to the demographic dividend has given rise to the emerging concept of the gender dividend, which refers to the increased contribution of women's work to the economy as fertility falls and greater gender parity is achieved in both education and formal workforce participation. In Ireland and South Korea, increases in female participation in the formal labor market driven by fertility decline reinforced age structure changes by further expanding the size of the paid workforce.²⁸ Estimates suggest that shrinking the gender gap in labor income by half by 2050 would quadruple annual growth of India's support ratio, or the number of economic producers per consumer.²⁹

Countries aiming to capture the benefits of a demographic dividend must emphasize gender-focused interventions that facilitate women's greater participation and equity within the formal labor market. While an array of policy interventions are available to governments to address gender gaps in the labor force, it is critical that those selected include efforts to reduce the double burden of work that employed women face in balancing jobs and gendered expectations around household responsibilities, including care for children and the elderly.³⁰ When women have equitable access to education and employment opportunities but face inequitable expectations of work performed at home, many choose paid work without the encumbrances of marriage and childbearing, leading to sharp declines in fertility rates such as those recently seen in East Asia.³¹

The Demographic Dividend Research Frontier

More research quantifying the contribution of specific policies and programs in the context of age structure change is critical. While there is a notable body of literature reinforcing the importance of the components of the demographic dividend theoretical model, the empirical impact of the specific policy interventions implemented in the context of age structure change is not well established. The absence of such analyses makes it difficult to compare the relative impact of different policy interventions, limiting countries' ability to prioritize evidence-based policy interventions that promote attainment of the dividend. In many countries, policymakers are looking for more specific guidance pointing to policy changes with the greatest impact.

There are several promising areas for further analysis:

- The number of countries that have successfully achieved the first demographic dividend is much smaller than the number that achieved its prerequisite: fertility decline and a temporary bulge in the working-age population. Efforts to market the successes of a handful of East Asian economies more than 30 years ago have become increasingly stale, begging the question of why there are so few more recent demographic dividend examples. Further research pinpointing the sources of policy failures in countries whose favorable age structures met with only tepid economic outcomes could steer others toward success.

- Increased female labor force participation is often touted as a significant benefit of fertility decline, and several studies referenced here reinforce that relationship. However, in many current high-fertility countries, female labor force participation is already relatively high, albeit concentrated in the informal sector, where women do not benefit from long-term savings plans or other safety nets. Analysis of the effects of fertility decline on women's educational attainment, transitions to formal or wage employment among women, and changes in women's per capita income may improve the case for gender-specific drivers of the demographic dividend.
- Building on Queiroz, Turra, and Perez (2006) and Lee and Mason (2010), further analysis of policies that inflate or extend the dividend is warranted. The economic miracles to which age structure change contributed in East Asia were not replicated in Latin America, despite the latter region's own fertility decline. Between 1975 and 1995, annual per capita GDP growth in Latin America was one-eighth the level enjoyed by East Asia. Policy priorities of governments in the region directly hindered the potential to capitalize on age structure change, compared to those established by the East Asian Tiger economies. Barriers to trade, corruption, and instable financial systems that disincentivized savings inhibited several countries in Latin America from reaping the demographic dividend.³² As countries move through the demographic transition and begin to experience the economic benefits of fertility decline, guidance around policy investments that maximize the size and lengthen the duration of the dividend is critical.
- While not governed by our inclusion criteria, models developed to project the potential demographic dividend have also incorporated indicators of governance—using such variables as the strength of public institutions, transparency and accountability, and regime type. Further research to document the contribution of specific policy interventions to enhance good governance to attainment of the demographic dividend is warranted.

Limitations

There are important limitations to this analysis. Within the sectors often included in theoretical models of the demographic dividend (health, education, governance, economic policy), we reviewed only papers that explicitly establish a link to economic growth *in the context of age structure change*. As a result, analyses of policies that impact economic growth were excluded unless they established direct or contextual linkages with age structure change. Within the literature that met inclusion criteria for this review, many of the studies are from the same few authors and apply similar econometric modeling approaches. We did not assess the methodological quality of papers meeting the inclusion criteria. Finally, some key research on this topic is embedded in books or articles that are not publicly accessible—including seminal literature such as the Birdsall, Kelley, and Sinding volume *Population Matters*—and therefore were not included in this review.³³

Annex: Papers Meeting Inclusion Criteria

QUANTITATIVE STUDIES				
STUDY	TITLE	SETTING	OUTCOME VARIABLE	POLICY INTERVENTION
Bloom and Sachs, 1998	Geography, Demography, and Economic Growth in Africa	Panel of 103 countries	GDP per capita	Openness to trade
Bloom and Canning, 2003	Contraception and the Celtic Tiger	Ireland	Income per capita	Legalization of contraception, free public education, openness to trade
Bloom et al., 2009	Fertility, Female Labor Force Participation, and the Demographic Dividend	Panel of 97 countries	Female labor force participation and GDP per capita	Policy changes to influence fertility choices
Bloom et al., 2010	Contribution of Population Health and Demographic Change to Economic Growth in China and India	China and India	GDP per capita	Government investment in disease prevention and public health, openness to trade
Lee and Mason, 2010	Fertility, Human Capital, and Economic Growth Over the Demographic Transition	Panel of 19 countries	GNP per capita	Per child spending on health and education
Queiroz, Turra, and Perez, 2006	The Opportunities We Cannot Forgo: Economic Consequences of Population Changes in Brazil	Brazil	Income per capita	Per child spending on health and education, spending on social security for adults

QUALITATIVE STUDIES				
STUDY	TITLE	SETTING	OUTCOME VARIABLE	POLICY INTERVENTION
McNicoll, 2006	Policy Lessons of the East Asian Demographic Transition	Taiwan, South Korea, Thailand, Malaysia, Indonesia, China, Vietnam	Health, governance	Investment in preventive health measures, improvements in stability and security of administrative systems
Pasay and Wongkaren, 2001	Population Policy and Programs in Indonesia	Indonesia	Fertility	Legal, policy, and program enabling environment for family planning
Ssewamala, 2015	Optimizing the 'Demographic Dividend' in Young Developing Countries: The Role of Contractual Savings and Insurance for Financing Education	Sub-Saharan African and Middle East/ North Africa	Education	Adoption of innovative approaches to reduce the costs of education and strengthen financial inclusion for indigent populations

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