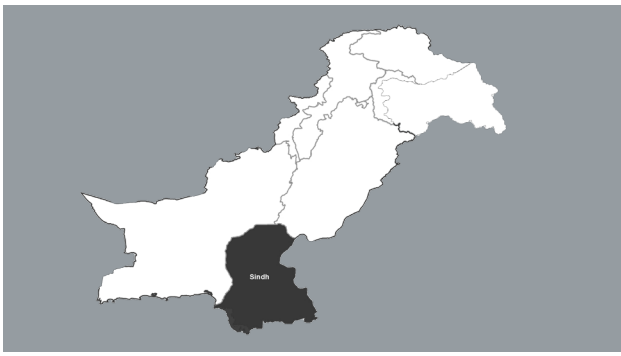
Prospects for Economic Growth in Sindh under Alternative Demographic Scenarios

The Case for a Rapid Fertility Decline



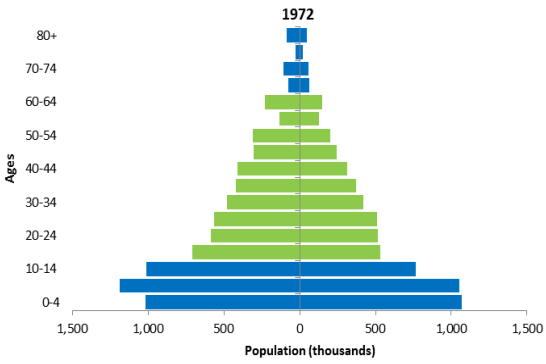
> Future economic growth is likely to be closely linked, if not driven, by how rapidly fertility declines further.
>
> Bloom, Chen, and Sathar 2015

While economic growth in Pakistan has averaged 3 percent over the past decade, Vision 2025 envisages it to be over 8 percent between 2018 and 2025. Sindh, which is the most industrialized of the four provinces and houses the major seaports as well as Karachi—the economic hub of the country—is a key stakeholder in national economic growth. Nearly half of the population of Sindh is urban, and there are marked disparities in socioeconomic development and human development indicators between rural and urban areas. Policymakers in Sindh are therefore well-acquainted with the different but equally challenging pressures of urban and rural population growth.

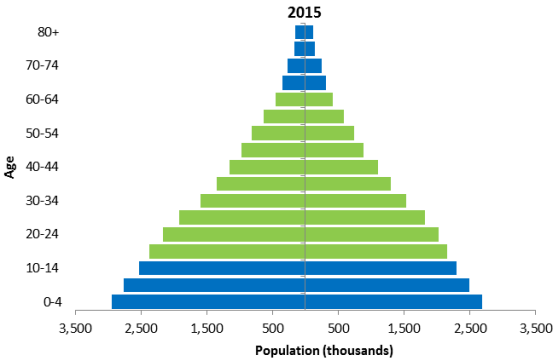
As Vision 2025 acknowledges and the provincial governments have experienced, a large and rapidly growing population can hamper economic growth by pulling investments away from productivity development towards expanding needs for education, health, housing, and other infrastructure. However, it is also recognized that inherent within the population challenge is a potentially tremendous opportunity to boost economic growth.

Sindh is currently undergoing a demographic transition from a situation of high fertility and high mortality to one of lower fertility and mortality (Figure 1). The resulting bulge in its working-age population means the province is poised to reap a "demographic dividend"—the boost in income per capita and its growth that accrues when the share of working age individuals in a population rises relative to dependents, resulting in a higher support ratio,[1] as well as increased labor supply and savings. As the Asian Tigers have demonstrated, a robust working-age population can serve as a potent, real world pathway for achieving economic growth. However, harnessing the powerful thrust of the demographic dividend requires the timely execution of a well-conceived plan of action involving major interventions in the education, health (including reproductive health/population welfare), and labor sectors.

FIGURE 1: EMERGING BULGE IN SINDH'S WORKING-AGE POPULATION



Source: Population Census 1972



Source: Population Council Projections 2015

Encouragingly, both Vision 2025 and the Government of Sindh government have a strong interest in enhancing the productive potential of the current and future work force through investments in education, skills development, and job creation. However, while the need to reduce population growth is recognized intuitively, there is relatively low awareness that the speed at which fertility declines now in Sindh will have a huge impact on the magnitude of the economic boost it is able to reap from the demographic dividend. A recent study of prospects for economic growth in Pakistan under alternative demographic scenarios quantified the massive differences in growth that can be achieved with slow, moderate and rapid fertility decline in Sindh.[2] This brief presents the study's key findings to facilitate a deeper understanding of the connection between the speed of fertility decline and the size of the demographic dividend, and the scale of the economic gains at stake.

> "The need for lowering the growth rate of population is more urgent than ever."
>
> *VISION 2025*

FERTILITY DECLINE AND PROSPECTS OF A DEMOGRAPHIC DIVIDEND IN SINDH

As fertility declines in Sindh, the rate of growth in the lowest tiers of its population pyramid (ages 0-14) is slowing down. However, due to the momentum of past high fertility and current improvements in infant and child survival, there will not be an appreciable change in the rate of growth of the working-age population for perhaps two decades. In proportion to dependents, the working-age share of the total population is rising.

To assess the effect of this rising support ratio on future economic growth, Bloom, Chen and Sathar (2015) employed state-of-the-art theoretical and statistical models designed to capture the complexity of economic growth processes and their interactions with demographic trends specific to the Pakistani context. The model is outlined in Box 1 (back page). Projections of the total population were generated for three fertility decline scenarios—moderate decline in the total fertility rate (TFR) from the current level of 3.9 to replacement fertility (TFR 2.1) in 2050;[3] slow decline in TFR, which would mean that replacement fertility is reached sometime after 2050; and rapid decline in TFR, implying that replacement fertility is attained before 2050. For population projections, the base year was 1998, when the last census was conducted, while 2011 was taken as the base year for the per capita income and demographic dividend comparison. The results of the study for Sindh are summarized in Table 1.

TABLE 1: PROJECTED DEMOGRAPHICS AND ECONOMIC GROWTH IN SINDH IN 2050 WITH SLOW, MODERATE, AND RAPID FERTILITY DECLINE

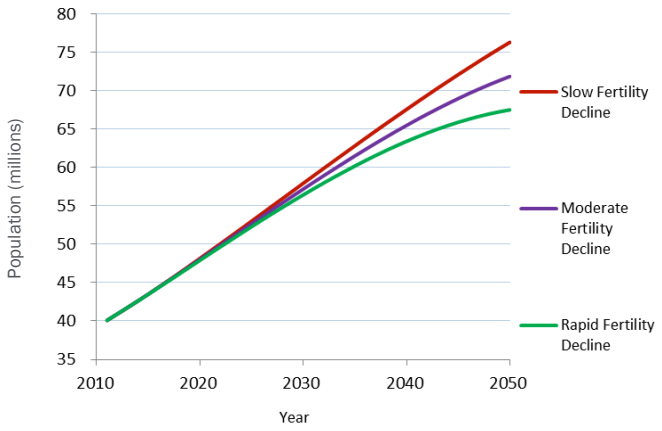
	Scenario 1 Slow Fertility Decline	*Scenario 2* Moderate Fertility Decline	*Scenario 3* Rapid Fertility Decline
Assume TFR	Remains 0.5 births higher than the moderate decline assumption	Declines steadily to 2.1 births per woman by 2050	Remains 0.5 births lower than the moderate decline assumption
Total Population	76.3 million	71.9 million	67.5 million
Support ratio	1.62	1.77	1.94
Per capita GDP Growth	**328%**	**374%**	**426%**
Demographic Dividend	**137%**	**182%**	**235%**

Source: Bloom, Chen, and Sathar 2015

As shown in Figure 2, depending on the speed of fertility decline, the population of Sindh could grow to 76 million or to 68 million by 2050. Compared to a scenario of rapid fertility decline, slow fertility decline implies approximately 6.2 million more young dependents in the population. This will translate into a lower support ratio—1.62, as against 1.94 with rapid fertility decline (Table 1).

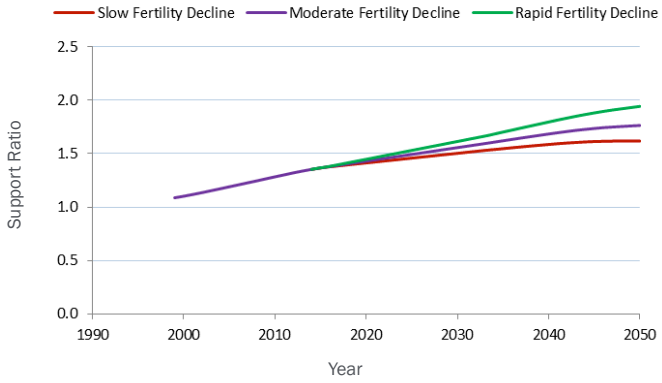
A higher support ratio represents an increase in the productive capacity of the economy on a per capita basis, which creates the prospect of a spurt in economic growth—the demographic dividend. To maximize the size of the demographic dividend, the support ratio must be maintained at optimal levels while the "boom" in the working-age population lasts. Fertility must decline as much as possible to raise the support ratio, and as fast as possible to allow the high support ratio to prevail over a longer period. Figure 3 presents the historical and prospective trend in Sindh's support ratio and how it is affected by the pace of fertility decline. Notably, the support ratio started to rise in the late 1990s—when energetic efforts were made to increase uptake of family planning—but it is now beginning to plateau. It can be expected to rise significantly if a moderate or rapid pace of fertility decline is achieved.

FIGURE 2: PROJECTED POPULATION GROWTH IN SINDH WITH SLOW, MODERATE, AND RAPID FERTILITY DECLINE



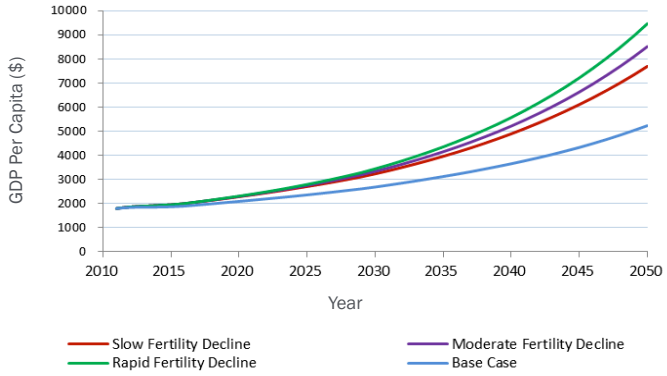
Source: Bloom, Chen, and Sathar 2015

FIGURE 3: HISTORICAL TRENDS AND PROJECTED GROWTH IN SINDH'S SUPPORT RATIO WITH SLOW, MODERATE, AND RAPID FERTILITY DECLINE



Source: Bloom, Chen, and Sathar 2015

FIGURE 4: PROJECTED PER CAPITAL GDP GROWTH IN SINDH WITH SLOW, MODERATE, AND RAPID FERTILITY DECLINE



Source: Bloom, Chen, and Sathar 2015

Differences in the support ratio, in turn, lead to wide divergences in the per capita GDP growth attainable (Figure 4). In 2050, per capita income in Sindh is expected to be slightly above $5,200 if fertility persists at current levels; about $7,700, if fertility declines slowly; and about $9,500, if fertility drops rapidly.

This means that if the fertility rate continues to hover in the current vicinity of 3.9, Sindh's GDP per capita will only be about 191 percent greater in 2050 than it is today; however, if the TFR declines rapidly, Sindh's GDP per capita could grow by as much as 426 percent. In other words, a precipitous decline in fertility could boost income in Sindh by 235 percent over current levels, independent of any additional income growth that occurs over this horizon. By comparison, a slow decline in fertility would lead to a 137 percent increase in income, which, significant as it is, represents only about half of the dividend achievable.

The results show that, overall, for every one unit of decrease in the total fertility rate, GDP per capita is expected to increase by 90-100 percent. Further fertility decline is going to be associated with a rise in per capita income, but the level of benefits to be accrued will multiply if there is a serious effort at interventions that speed up the decline while the support ratio is elevated. This is a strong economic argument for investing in a more rapid fertility decline in the province.

> "Our Vision today is to make Pakistan the next Asian Tiger."
>
> *VISION 2025*

POLICY IMPLICATIONS

By 2050, Sindh's per capita income will be 191 percent higher than today's levels if there is no decline in fertility, but 426 percent higher if fertility declines rapidly. The scale and effectiveness of efforts to reduce fertility levels in Sindh will determine whether per capita income in the province grows by 328 percent or by 426 percent by 2050. The possible demographic dividend of a 235 percent increase in per capita income is simply too huge to be ignored in economic growth strategy, especially given Sindh's burgeoning population, resource constraints, and development aspirations. The findings presented in this brief show clearly that, if Sindh is to harness the demographic dividend, planners must invest at least as heavily and urgently in efforts to raise the contraceptive prevalence rate (CPR) as in interventions to educate, train and productively employ the youth bulge.

Time is of the essence. The demographic dividend is a limited-time offer, and once fertility reaches replacement levels, the demographic transition model predicts some semblance of equilibrium between fertility and mortality levels. By around 2050, the bulge that is currently in the working-age tiers will have progressed through to older tiers of the pyramid, while a reduced population of young people will have entered Sindh's work force. Accordingly, the support ratio will decline and the dividend window will close.

> "The speed at which fertility declines now in Sindh will determine the magnitude of the economic boost it will experience."

Sindh must promptly to lower its TFR and maintain a high support ratio through the dividend period. The process can be kick-started by focusing on eliminating unmet need for family planning, which is estimated at 21 percent, and represents an opportunity for a rapid demand-driven increase in Sindh's CPR from the current level of 30 percent to 51 percent. This alone will reduce the TFR from 3.9 to the wanted level of fertility of 3.1 (PDHS 2013). In comparison, the Sindh government's goal of raising the CPR to 45 percent by FP2020 will reduce the TFR to 3.3. While increased investment in family planning will be entailed in eliminating unmet need, and further efforts will be needed to ensure a continuation of the rapid fertility decline trajectory, the costs are more than justified by the substantially large economic boost achievable.

ENDNOTES

(1) The support ratio expresses the proportion of working-age individuals relative to dependents in the population. It is defined here as the working age population (15-59) divided by the non-working age population (<15 or>59 years). **(2)** D. E. Bloom, S. Chen and Z. Sathar, "Prospects for economic growth in Pakistan under alternative demographic scenarios" (Population Council, Islamabad). **(3)** The TFR measures the average number of children expected to be borne by every woman in a population during her lifetime. The model's TFR assumptions for the three fertility decline scenarios are indicated in Table 1.

BOX 1: MODEL USED TO PROJECT PROSPECTS FOR ECONOMIC GROWTH UNDER ALTERNATIVE DEMOGRAPHIC SCENARIOS

GDP growth estimations in the model follow the convergence model proposed by Barro (2004). The final multiple regression growth equation is derived by manipulating the Solow growth model and states the determinants of the growth of income per capita.

$$\dot{y}t = -\alpha y_t + \beta w_t + \varkappa \dot{w}_t + \delta l_t + \eta^T X_t + \epsilon_t$$

Where $yt = \log(\frac{Yt}{Pt})$ (Y is aggregate income), $w = \log(\frac{Yt}{Lt})$ (L is labor force) and X_t denotes time-variant control variables other than demographic variables.

The model assumes Sindh's total fertility rate, which currently stands at about 3.9 children per woman, will decline to the long-run replacement level of 2.1 children per woman. The model also assumes that life expectancy in Sindh will increase to 69 years by 2050.

To test the sensitivity to fertility rates, three fertility decline scenarios are considered:

1. Moderate fertility decline (Medium Variant), which assumes that the TFR declines at a steady pace and reaches replacement level (2.1 births per women) by 2050.
2. Rapid fertility decline (Low Variant), which assumes that TFR is 0.5 births lower than under the medium fertility (1.6 births per woman) assumption throughout.
3. Slow fertility decline (High Variant), which assumes that the TFR is 0.5 births higher than under the medium fertility (2.6 births per woman) assumption throughout.

An indicator "IDD" is introduced, which measures the relative size of demographic dividend and is defined as

$$IDDi = \frac{y^i_{2050} - y^0_{2050}}{y_{2011}}$$

Where y^i_{2050} is the GDP per capita in 2050 under scenario i, y^0_{2050} is the GDP per capita in 2050 in base case scenario and y_{2011} is the GDP in the staring year.

Source: Derived from Bloom, Chen, and Sathar (2015).

THE EVIDENCE PROJECT

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The Evidence Project uses implementation science—the strategic generation, translation, and use of evidence—to strengthen and scale up family planning and reproductive health programs to reduce unintended pregnancies worldwide. The Evidence Project is led by the Population Council in partnership with INDEPTH Network, International Planned Parenthood Federation, Management Sciences for Health, PATH, Population Reference Bureau, and a University Research Network.

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