

World Bank Group

# PAKISTAN@100

# HUMAN CAPITAL

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# GLOSSARY

<b>ASER</b>	Annual Status of Education Report
<b>BHUs</b>	Basic Health Units
<b>BISP</b>	Benazir Income Support Program
<b>CCT</b>	Co-Responsibility Cash Transfers
<b>CDR</b>	Child Dependency Ratio
<b>CNICs</b>	Computerized National Identity Cards
<b>CRM</b>	Child Rights Movement
<b>ECD</b>	Early Childhood Development
<b>FATA</b>	Federally Administered Tribal Areas
<b>GDP</b>	Gross Domestic Product
<b>GER</b>	Gross Enrollment Ratio
<b>HIC</b>	High Income Country
<b>LFP</b>	Labor Force Participation
<b>LMIC</b>	Lower Middle-Income Country
<b>MDGs</b>	Millennium Development Goals
<b>MICS</b>	Multiple Indicator Cluster Survey
<b>NADRA</b>	National Database and Registration Authority
<b>NSER</b>	National Socio-Economic Registry
<b>ODI</b>	Overseas Development Institute
<b>PPP</b>	Purchasing Power Parity
<b>PSLM</b>	Pakistan Social and Living Standards Measurement
<b>RDA</b>	Recommended Daily Allowance
<b>SAHE</b>	Society for The Advancement of Education
<b>SAP</b>	Social Action Program
<b>SAR</b>	South Asia
<b>SMS</b>	Short Message Services
<b>STEP</b>	Skills Toward Employability and Productivity
<b>TVET</b>	Technical and Vocational Education And Training
<b>WeT</b>	Waseela-E-Taleem
<b>WPP</b>	World Population Prospects

## EXECUTIVE SUMMARY

**Human capital is the stock of accumulated knowledge, experience, and attributes that the worker brings to and uses in producing goods and services in an economy.** Human capital is a key determinant of labor productivity, and plays an essential role in determining a country's long-term development path. Enhancing it requires focused investments at each stage of the life cycle. Investments in other areas, however important, will not yield intended gains in economic growth unless they are complemented by a meaningful framework for boosting human capital growth in a country. The objective of this report is to highlight the critical role of human capital in the future of Pakistan, and to identify critical areas for investment and policy action that will help it become an upper-middle-income country by 2047—the country's centenary.

**Growth accounting points to the importance of labor productivity, along with employment outcomes, in determining a country's long-term growth path.** There is global consensus regarding the importance of early childhood development in setting the path for human capital accumulation, and subsequent productivity growth. Progress in maternal and child health and nutrition are key prerequisites for early childhood development, and central in the reproductive health and population agenda. A country's growth can be boosted by the demographic dividends that occur when the share of workers in the population is increasing relative to their dependents. But demographic dividends can only be realized when there is parallel progress in reproductive health, improvements in education, and labor force participation, particularly of females. This progress is in turn linked with declining infant mortality rates, and increasing educational attainment, life expectancy, and income—all associated with reductions in total fertility rates. Countries that have sustained rapid growth over decades have typically demonstrated strong public investment in these areas of human development, and have benefited from the demographic dividends.

**Pakistan, however, is not fully benefitting from its favorable demographic tailwinds due to an underinvestment in, and an underutilization of, human capital.** The country is experiencing a youth bulge (with the number of individuals entering the labor market in the coming years expanding at a faster rate than the total population). If the economy is able to absorb these young labor force entrants into productive activities, the bulge could be turned into a dividend. However, the country's accumulation of human capital—critical to improving productivity and employability—has been sluggish, in part due to Pakistan's high fertility rates and low health and educational attainment levels. The country is also challenged by the need to create enough jobs for its growing population, improve the quality and productivity of these jobs, and enhance access to jobs and economic opportunities for disadvantaged groups, including women. A failure to realize the promise of a young population can have negative social, economic, and political consequences in both the short and long run.

**Gains in the areas of health, nutrition, education, and female empowerment do not only represent development progress in and of themselves, but also accelerate income per capita**

**growth.** There is a close link between a demographic transition and demographic dividends, with growth in the share of the working-age population generally associated with higher per capita income growth. Changes in age structure are also associated with changes in labor productivity over time. An analysis of various population growth scenarios shows how progress in human development outcomes leads to reductions in total fertility rates, and how improvements in education resulting from fertility declines can accelerate income per capita growth. Five different scenarios have been analyzed in this report, which suggest that demographic change will need to be accompanied by rapid improvements in educational attainment and labor productivity for Pakistan to reach upper-middle-income status by 2047.

## FOUR PILLARS OF HUMAN CAPITAL, AND A DIAGNOSTIC OF PAKISTAN

**A simple conceptual framework consisting of four critical pillars of human capital accumulation can help policy makers design and implement key policy measures to boost human capital and labor productivity.** The life-cycle approach—which builds on the Skills toward Employability and Productivity (STEP) framework—highlights the importance of early interventions, since the returns to investment are largest at early stages of the life cycle. The report provides a diagnostic of Pakistan’s progress on human capital outcomes in each of the four pillars.

### *Pillar 1: Informed Decisions on Parenthood*

**Declining fertility rates and slowing population growth tend to be associated with economic growth and poverty reduction.** As women gain better access to high-quality reproductive health information and services, their overall health and their children’s health tend to improve. Lower fertility and better reproductive health are associated with greater female labor force participation. Starting families off on the right foot by fostering informed decision-making regarding childbirth and parenting can contribute to human capital accumulation across generations. Countries that have sustained rapid growth have achieved demographic dividends through a decline in fertility rates and improvement in the quality of human capital.

**Pakistan experienced a steady decline in fertility between 1970 and 2015, measured in terms of both total fertility and adolescent fertility rates, but progress has been slow and not evenly achieved.** Despite overall progress in informed parenthood decisions, there is a notable difference between wanted and actual fertility rates. Such differences are particularly prominent among the poor. Overall gender empowerment could help close this gap. Informed decisions regarding the use of contraceptive methods and birth spacing affect fertility rates, as does mothers’ access to care and services, which differs widely across provinces and income levels.

### *Pillar 2: Strong Start through Early Childhood Development*

**The skills developed in early childhood (from conception, through the first 1,000 days after birth, to school entry) form the basis of future learning and labor market success.** The window of opportunity is small, and failure to invest in early childhood development is costly to compensate for later in life. The importance of investing during the early years is well established by overwhelming global evidence. During this period, supporting the basic health and nutrition of the



mother and child is critical. In addition, family and community environments conducive to appropriate care are important.

**There has been a significant reduction in maternal and infant mortality rates over time in Pakistan, but compared to other countries the pace of progress has been slow and rates remain relatively high.** Pakistan also has the highest rate of child stunting in the region. Nutrition outcomes differ significantly across wealth quintiles. The lagging outcomes of poorer households reflect overall environmental factors that impact children’s health, including disposable income, parents’ education and involvement in child development, access to health and nutrition services, and limited knowledge and awareness of practices fostering child development.

### *Pillar 3: Education and Learning for All*

**Ensuring that students attain relevant, high-quality education is a fundamental element of the life cycle of human capital development.** Gaps in foundational skills affect not only the starting points of new workers entering the labor market but also their growth trajectories. Despite the evidence, learning outcomes, especially in developing countries, are dangerously low. With drastic gaps in learning levels, it will not be possible for school enrollment to translate into labor productivity and economic growth. Countries need to foster innovation and entrepreneurship to fully reap the benefits of human capital accumulation. Countries lagging in learning outcomes have to prioritize the development of strong systems with defined learning standards for teaching and instruction, adequate resources, and a strong regulatory environment for education.

**Improvements in education, in terms of both attainment rates and quality, have been slow.** For its level of income, Pakistan’s school enrollment rates are low and it is yet to achieve universal primary education. Pakistan faces a serious challenge: an estimated 22.6 million children do not attend school, 18 million of whom are between 10 and 16 years old. The gender and regional gaps in these outcomes remain significant, and disparities exist across and within provinces. Household incomes are strongly associated with children’s school enrollment rates, suggesting that demand-side access issues are significant determinants of education levels. The quality of learning outcomes is a source of concern. Progress in improving them could be hampered by too few schools, inadequate school infrastructure, and teachers lacking the required qualifications. Weak academic support from parents and students’ poor health status are also contributing factors.

### *Pillar 4: Labor Productivity*

**Utilizing accumulated human capital in productive activities is as important as accumulating human capital.** In this context, jobs are transformative for development—high productivity levels, labor force participation, and the economy’s ability to innovate help ensure that educational gains translate into economic growth. However, even if individuals have the skills to be productive and creative, employment and productivity can be hampered if labor markets do not function well. Therefore, governments need to facilitate labor mobility, boost labor force participation, upgrade the skills of the workforce, and improve the matching of skills with jobs.

**Pakistan’s labor market has, to date, not undergone the structural change that traditionally accompanies income per capita growth.** Sector composition remains static, with the large majority

of workers employed in agriculture and the informal economy. In a dynamic economy, as the educational attainment of youth improves over that of their older counterparts, they typically get an increasing share of wage employment in the non-agricultural sector. This is not the case in Pakistan, where young workers' jobs are similar or worse than those of their older counterparts. In addition, with a low female labor force participation rate, human capital in Pakistan is severely under-utilized. While the pace of job creation has kept at par with labor force growth till now, there will be a huge jobs gap unless the economy can sustain its ability to create jobs and maintain economic growth.

**Given the type of labor market opportunities available—mostly concentrated in agriculture or non-wage employment—and the slow pace of structural transformation, improvements in education and skills may not be fully reflected in improved labor market outcomes.** Whereas the education system supports the development of skills in the future workforce, the existing stock also needs to acquire and upgrade skills. Technical and vocational training opportunities are diverse in Pakistan, yet reach only a small proportion of the labor force; their relevance is often challenged. The country's many illiterate and low-skilled workers have limited options for skills development and upgrading. This poses a tremendous challenge for a country seeking to achieve upper-middle-income status within the next decade.

## LOOKING FORWARD

**This report highlights the trends and current conditions of human capital development in Pakistan through a life-cycle lens.** Each stage of the life cycle is inter-connected, and investment across all required. The challenges are daunting, and there are areas where significant and intentional policy actions are needed. Gaps and discrepancies across income levels and gender should be noted, and are relevant to all outcomes. Prioritization and targeted approaches merit greater policy commitment.

**A critical question remains: Why have all the interventions and investments made in human capital to date not yet improved the indicators?** Part of the problem appears to be the consistently high population growth rate, which has inadvertently muted the impact of any reform. Some studies suggest that political instability and security issues have also been factors. The governance of the service delivery system—combined with a level of citizen voice too weak to hold policy makers accountable for poor service delivery—is another matter of concern. These and other factors might be better addressed if a life-cycle approach to human capital development and a recognition of its importance in the country's growth were made policy priorities in Pakistan.

## WHAT CAN PAKISTAN DO DIFFERENTLY IN THE NEXT 30 YEARS?

**First, Pakistan needs to significantly increase public financing of the delivery of services related to human capital, and ensure adequate governance of the spending.** Public financing of service delivery in education, health, and social protection is currently far below that of comparable economies. The government needs to bolster human capital investment by allocating greater resources. However, increasing spending does not automatically lead to better outcomes; the quality of spending must also improve. Citizens' voice and agency are critical in shaping the demand for better services. Massive information campaigns using various forms of media, including short

message services (SMS), are required to raise awareness about citizens' rights and the state's responsibilities. Providing a platform for citizens' feedback on the provision of basic services—and mechanisms to reflect the feedback—are also important.

**Second, to maximize impact with limited resources, targeted interventions are required for those lagging behind—low-income households, populations in disadvantaged areas, and women, among others.** Targeted interventions, focusing on low-income populations and female empowerment, can be facilitated by the country's social protection delivery systems. The National Socio-Economic Registry has been instrumental in objectively identifying the poor for the country's flagship safety net program—the Benazir Income Support Program. Building on the lessons learned, provincial initiatives can significantly strengthen their social protection investment to enhance the human capital accumulation of the target populations. In particular, investment in girls' human capital cannot be overemphasized.

**Third, Pakistan needs to take a holistic approach to human capital investment, focusing on the first 1,000 days.** Making informed parenthood decisions and investing in children's developmental outcomes are highly related actions. Early childhood development has significant implications for children's learning in school, and learning and cognitive skills have a major impact on later earnings in the labor market, which in turn determine investment in the next generation's human capital. Holistic investment in the early years can thus help to break the vicious cycle of intergenerational poverty transmission. Key complementary investments and supports would thus need to be designed as integrated packages:

- Step 1 would be a family support package for the early years—parental support, including planning for family size; maternal education on health and nutrition; and children's early nutrition and stimulation as well as health and sanitation—particularly for vulnerable families.
- Step 2 would be a pregnancy package with pre- and ante-natal care, and information on nutrition.
- Step 3 would be a birth package, including an attended and skilled delivery, birth registration, and information on the benefits of exclusive breastfeeding.
- Step 4 would introduce a child's health and development package, with immunizations, information on deworming, identification and treatment of acute malnutrition, and other relevant information.
- The final step 5 would be a preschool package featuring good-quality preschool and early childhood development programs.
- An additional step—the sharing of information on health and hygiene, nutrition, and diet at the school level—may be useful in the Pakistani context.

**Fourth, policies to address the challenges faced by the existing stock of the labor force should be strengthened.** While programs to invest in the human capital of the future workforce are important, skills development and upgrading opportunities for the existing stock of the labor force, who have missed out on earlier opportunities, should not be neglected. A suite of second-chance interventions tailored to individuals with various needs and abilities can be considered. Policies

should address labor market imperfections and challenges, and promote competitiveness through high-quality tertiary education if Pakistan's economy is to leapfrog into the era of the fourth industrial revolution. Potential growth sectors in the economy need to be identified as priorities for tertiary education. Private sector investment in tertiary education has played an important role in the education landscape, and equitable access to institutions of higher learning can be ensured by introducing and strengthening student loan schemes.

# INTRODUCTION

**Human capital, as defined in Mincer (1958) and Becker (1964), generally means the abilities, qualities, and attributes that contribute to making labor (workers) more productive**—such as knowledge, experience, diligence, motivation, and grit. Human capital also refers to those skills—both cognitive and non-cognitive—that contribute to a person’s productivity and thus, the value of earnings made over a lifetime (World Bank 2018b). It can be fostered by investment in people, most notably through health care, education, and training. Such investment can yield returns when an economy utilizes its stock of human capital for the production of valuable goods and services.

**A country’s long-term economic development crucially depends on human capital.** Human capital can boost growth in two ways: first, by improving the capacity to absorb and adapt new technology, which will affect short- to medium-term growth, and, second, by catalyzing the technological advances that drive sustained long-term growth (World Bank 2018c). In light of an abundant labor supply and a demographic transition leading to an increase in the working-age population, investment in human capital and its utilization is critical to stimulating growth in Pakistan.

**Overall, human capital enhancement requires intentional investment at each stage of the life cycle, as highlighted in the Skills toward Employment and Productivity (STEP) framework (World Bank 2010).** The well-known expression “skills beget skills” captures the continuum of human capital investment. Investing in skills and labor—the most important assets of the poor—and then supporting their efficient utilization are the most sustainable means of contributing to an economy’s growth. Efforts to support health, nutrition, early childhood development starting from home and through formal education, and labor market experiences all play a critical role.

**To understand the factors that influence the accumulation and utilization of human capital requires looking at these processes from multiple angles and perspectives.** Factors such as individual and households decisions to invest in human capital and use basic services, service providers’ ability to provide information and good-quality services, and government capacity to monitor quality and provide support for those left behind, are important dimensions. Also, human capital accumulation is a dynamic process that begins before birth, supported by investments in maternal health and nutrition, and then continues through early childhood development, and through schooling and labor market experiences. A unidimensional analysis tends to miss out on crucial aspects of these dynamic processes.

**In this context, the objective of this document is to highlight the critical role of human capital in Pakistan’s future.** Investments in other areas will not yield intended gains in economic growth unless they are complemented by a meaningful framework to boost human capital growth in the country. Notwithstanding the critical importance of tertiary education<sup>1</sup> in the growth of an economy,

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<sup>1</sup> Defined as education at levels beyond the 12th grade.

this note, forward looking as it is, focuses on basic levels of education and skills. A healthy and productive labor force requires efficient, effective basic education and health systems with a focus on the lower-income quintiles of the population. This note presents a comprehensive diagnostic meant to inform the inclusive enhancement of human capital in the country of Pakistan, and discusses policy implications. Its recommendations take into account the life cycle of human development and an integrated sectoral approach. The remainder of the note is organized as follows:

- Chapter 1, “The Big Picture—Human Capital and Long-Term Growth,” highlights the important linkage between human capital and economic growth based on a large body of existing literature. It then illustrates how changing demographics and human capital might influence Pakistan’s future.
- Chapter 2, “Four Pillars of Human Capital,” uses the life-cycle approach to human capital investment to discuss key policy issues related to each stage. It summarizes both analytical evidence and widely held policy consensus.
- Chapter 3, “A Human Capital Diagnostic of Pakistan,” assesses the evolution of human capital outcomes over the past decade and diagnoses the current status of human capital investment and utilization in the country. Key factors affecting those outcomes are examined.
- Chapter 4, “Policy Discussions,” reviews the main policy drivers in place in the country. A discussion of what has worked well and what has not sheds light on the policy direction that Pakistan needs to pursue to address the human capital challenges identified in earlier chapters.
- Chapter 5, “Conclusion,” discusses what it would take for Pakistan to achieve its PK@100 goals with respect to human capital.

# CHAPTER 1. THE BIG PICTURE: HUMAN CAPITAL AND LONG-TERM GROWTH

## 1.1 GLOBAL EVIDENCE: LABOR PRODUCTIVITY AS A DETERMINANT OF GROWTH

**Growth accounting points to the importance of labor productivity (as a result of investment in human capital) along with employment outcomes (as a result of the utilization of human capital) in determining a country's long-term growth path.** A large body of literature has highlighted the positive association between human capital and economic growth (Romer 1990a, 1990b); Barro 1991; Lucas 1988; Mankiw, Romer, and Weil 1992). Across various examinations of economic growth trends around the world, one of the most robust and widely accepted conclusions involves the centrality of a nation's human capital (Hanushek and Kimko 2000).

**A country's economic growth rate is directly related to its stock of human capital.** Theoretical models that uphold this have been developed in a variety of studies (e.g., Barro 1991; Romer 1990a; Rebelo 1991). In the simplest formulation, growth rates are affected by ideas and invention, which in turn are related to the stock of human capital either through research and development activities or through adoption behaviors. These formulations indicate not only why the level of output is higher when a country has more human capital but also why the growth rate is higher. In Romer (1990a), for instance, human capital influences the supply of ideas and new technologies, and is the key input into the research sector, which generates the new products or ideas that underlie technological progress (Romer 1990b).

**The most frequently used measures of human capital have focused on school attainment, but it is now firmly established that it is the *quality* of education that determines human capital accumulation.** Romer (1990b), Barro (1991), and Mankiw, Romer, and Weil (1992), for instance, use primary- or secondary-school enrollment rates. However, there are conceptual and practical issues with using school enrollment or years of schooling as a proxy for human capital, as the *quality* of human capital matters. More recent analyses have placed greater attention on quality when using education as a proxy for human capital. While developing countries have made considerable progress in closing the gap with developed countries in terms of school attainment, the quality of education remains a concern, with implications for economic growth. The global evidence (Hanushek and Kimko 2000; Hanushek and Woessmann 2007, 2012; Altinok, Angrist, and Patrinos 2018, for instance) shows that student achievement and test scores—rather than years of schooling alone—are significantly associated with growth.

**Given that investment in children's health, nutrition, and home environments with adequate parental input sets up the basis for further skills accumulation through formal education, there is global consensus regarding the importance of early childhood development.** A variety of analyses emphasize the importance of various health and nutrition factors in determining learning

outcomes (Bloom, Canning, and Jamison 2004; Bundy 2005; Gomes-Neto et al. 1997, for instance). Until they address these factors, and close existing gaps with the developed part of the world, developing countries will find it difficult to improve their long-run economic performance (Hanushek 2013).

**Economies that have sustained rapid growth over decades have typically demonstrated strong public investment in basic education.** A common question is how much education should be general in nature and how much should be vocational. Vocational education is designed to provide students with specific job-related skills that will allow them to move easily into employment. This type of education appears very attractive when there are large youth unemployment problems as is the case in many developing countries. However, Aghion and Howitt (2009) suggest that countries with productivities far from the technological frontier should put more emphasis on basic education rather than higher or vocational education. It is because basic education, a key foundation for building human capital, can provide a bigger boost for most low- and middle-income countries that are far from the global technological frontier (Aghion and Howitt 2009; Aghion et al. 2009; Madsen 2014).

**Progress in health, nutrition, and population outcomes is also essential for sustained income growth.** Reducing infant and child mortality, and child stunting and wasting, while improving life expectancy, represent development progress in and of themselves. In addition, they can also stimulate accelerations in labor productivity and income per capita growth. From the seminal work of Grossman (1972), many studies note that investments in health can raise the productivity and earnings of workers by increasing the amount of healthy time available for market work. Moreover, with reductions in infant and child mortality rates and improvements in life expectancy, countries are able to progress in the demographic transition process, and reduce total fertility rates, ultimately leading to a decline in dependency ratios and a rise in the share of the working-age population. This in turn can lead to the possible realization of demographic dividends (Lee and Mason 2006; World Bank 2015). If a larger share of the population is working, average standards of living will be higher. At the same time the accelerated growth of the working-age population allows for greater savings in the short run and more investment in human and physical capital in the long run.

**Progress in human capital development and income growth are, thus, undeniably interrelated.** As noted in the Unified Growth Theory of Galor (2011), as economies develop and undergo structural transformation, production becomes more sophisticated, leading to a rising demand for education. This contributes to reductions in total fertility rates, and subsequently allows economies to move from factor-accumulation-driven growth to sustained growth with a higher investment in human capital.

**Moreover, the demographic dividends mentioned earlier can only be realized when there is parallel progress in reproductive health, improvements in education, and rising labor force participation, particularly of females.** Indeed, greater female empowerment—allowing for greater agency in education, reproductive health decisions, and labor market engagement—is critical for facilitating the fertility decline that triggers the sustained growth under the Unified Growth Theory, as well as the realization of demographic dividends. World Bank (2018b) suggests that in South Asia

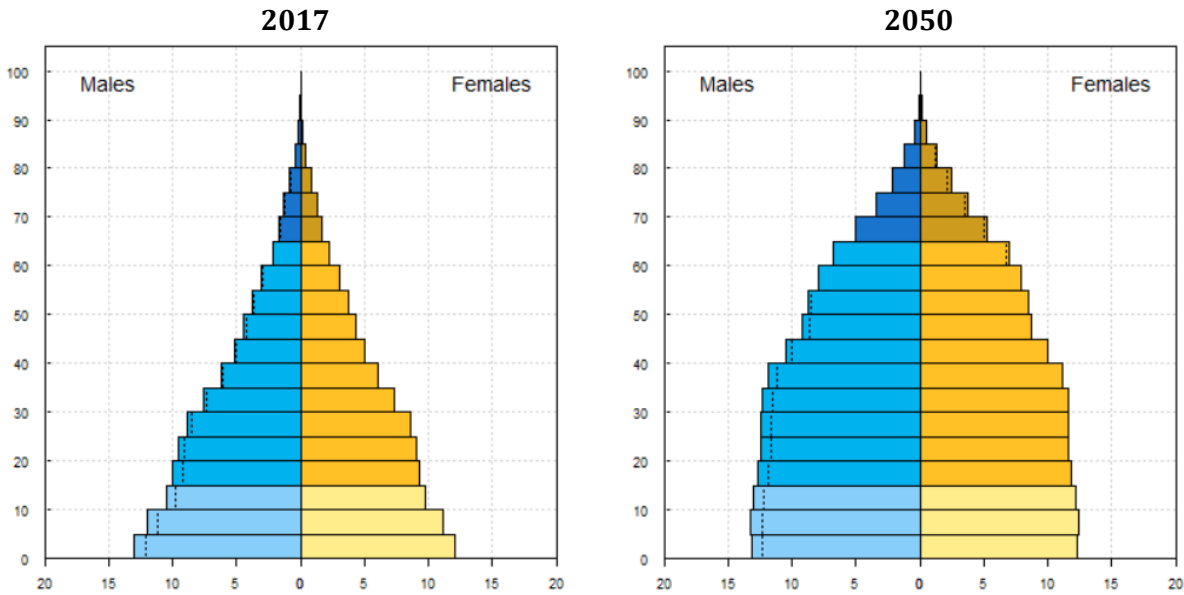


in 2014 over 80 percent of human capital wealth was attributed to men. Major gains in human capital wealth per capita can be achieved, therefore, if women are able to work more and earn more. Studies also suggest that the returns to education are often higher for women than for men.<sup>2</sup>

## 1.2 WHY IS HUMAN CAPITAL IMPORTANT TO PAKISTAN?

**Pakistan’s most abundant asset is labor, and it must create enough jobs for a growing population, improve the quality and productivity of jobs, and enhance access to jobs and economic opportunities for women and the disadvantaged.** As the world’s fifth-most-populous country, with a population of almost 208 million, human capital is an indispensable asset for Pakistan. Pakistan is experiencing a youth bulge, with the number of individuals entering the labor market over the upcoming years expanding at a faster rate than the total population. The key to reaping the benefits of a demographic bulge is falling dependency rates as the share of the working-age population is high, the share of young dependents is falling, and that of elderly dependents remains small. Pakistan’s youth bulge can be turned into a demographic dividend if the economy is able to absorb the substantial number of young workers entering the labor force by creating a sufficient number of good-quality jobs, and ensuring that individuals of working age—both men and women—participate in the labor force.

Figure 1. Population by Five-Year Age Group in 2017 And 2050



Source: UN World Population Prospects 2017 Revision.  
 Note: X-Axis is percent of males/females in a given age cohort; y axis is five year age cohort.

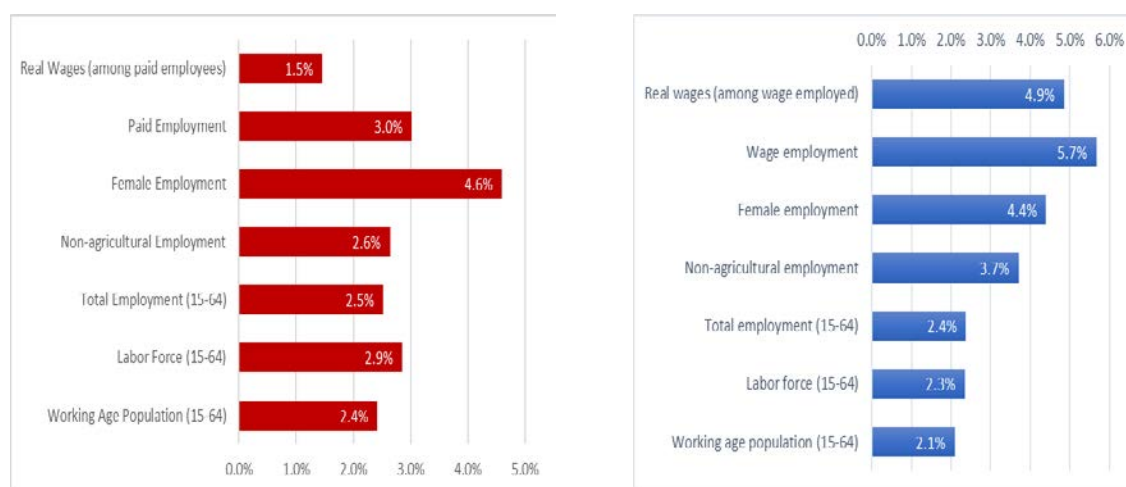
**The country’s working-age population, including youth, is growing, while dependency ratios are falling—demographic changes that tend to be favorable for growth.** Between 2004 and

<sup>2</sup> Montenegro and Patrinos (2016) find that, globally, the returns to education for women are 1.26 times those for men, with the highest ratio in South Asia at 1.46.

2015, the country's working-age population grew by 2.4 percent annually, whereas the total population growth rate over the same period was about 2.1 percent, with declining dependency ratios. Moreover, the labor force has grown more rapidly (by an average of 2.9 percent per year) than the working-age population growth, indicating an opportunistic condition in the labor market in Pakistan (Figure 2).

**But Pakistan is not benefiting from these promising trends amid the underutilization of human capital in the labor market.** Total employment growth lags behind labor force growth, indicating that a large majority of people are underutilized or searching for jobs. The growth rates of non-agricultural employment and paid employment are only 1 and 4 percentage points greater than that of total employment. This suggests slow job creation in the non-agricultural sector and paid employment, which typically are job-creating sectors in dynamic economies. For instance, in Bangladesh, where the ratio of the working- to non-working-age population is also growing, the labor market shows a far more rapid growth in non-agriculture wage employment than in total employment. In addition, real wage growth among paid employees has been growing by only 1.5 percent a year in Pakistan, which suggests modest improvement in the quality of jobs, or labor productivity. Female employment presents significant growth per year, in large part due to increases in labor market activities in rural areas.

**Figure 2. Annual Growth Rates of Key Labor Market Indicators, 2004–15: Pakistan vs. Bangladesh**

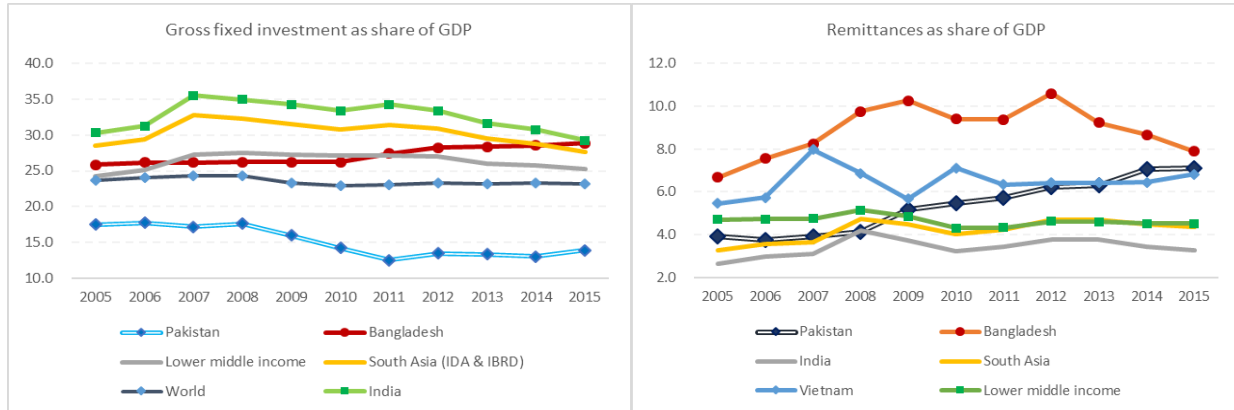


Source: Bossavie et al. (2018) (left); Farole and Cho (2017) (right).

**The importance of human capital is particularly salient since the country's accumulation of capital (through savings, foreign direct investment, and public investment) is sluggish.** Domestic savings and investment, for example, have been historically low, with less than 50 percent of savings directed toward the financial sector. The country's savings rate of 13.8 percent of the gross domestic product (GDP) (2011–15 average) compares unfavorably with that of neighboring countries: 33.2 percent in India, 29.7 percent in Bangladesh, and 24.5 percent in Sri Lanka over the same period. Also, Pakistan's gross fixed investment as a share of GDP is far behind other countries in the region. The average of the lower-middle-income countries declined significantly over 2008–11 and has not gone back to the levels seen before the global financial crisis (Figure 3, left). Meanwhile, remittance flows from Pakistani labor in the international labor market have been on the

rise and robust, which again highlights the country's reliance on human capital as its major productive asset (Figure 3, right).

**Figure 3. Gross Fixed Investment and Remittances as Share of GDP, 2005–15**

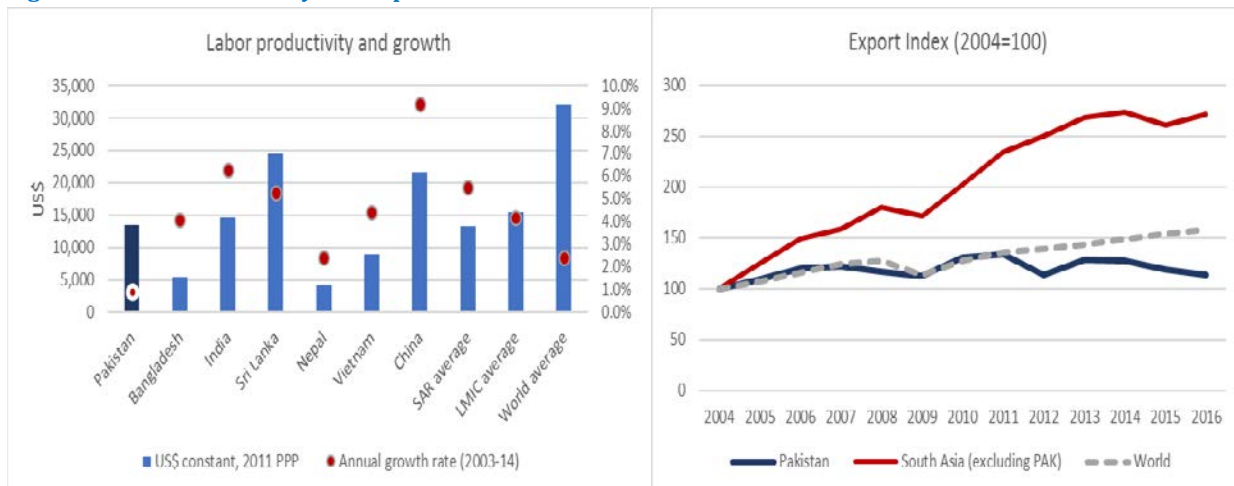


Source: World Development Indicators. Note: GDP = gross domestic product

**Pakistan’s labor productivity needs to grow faster to increase the country’s competitiveness.**

Labor productivity, measured as GDP per person employed, is stagnant: its growth rate is the lowest in the region and far below the average of lower-middle-income countries (Figure 4, left). In comparator economies such as India and China, average labor productivity growth rates over 2003–14 were 6.3 and 9.2 percent, respectively. In part due to low and stagnant labor productivity, Pakistan’s competitiveness in the export market seems to be lagging. While exports have driven economic growth and poverty reduction in the region, Pakistan’s exports of goods and services in 2015 were at about the same level as in 2004 (Figure 4, right).

**Figure 4. Labor Productivity and Exports over Time**



Source: World Development Indicators.

Note: LMIC = lower-middle-income country; PPP = power purchase parity; SAR = South Asia.

## Box 1. Pakistan's Changing National Wealth

Countries regularly track gross domestic product (GDP) as an indicator of their economic progress, but not wealth—that is, the assets, such as infrastructure, forests, minerals, and human capital, that are used to produce GDP. In contrast, corporations routinely report on both their income and assets to assess their economic health and prospects for the future. Wealth accounts allow countries to take stock of their assets to monitor the sustainability of development, an urgent concern today for all countries.

The World Bank recently released estimates of the changing wealth of 141 nations over 20 years, from 1995 to 2014 (Lange, Wodon, and Carey 2018). National wealth is defined as the sum of produced capital such as factories and infrastructure, 19 types of natural capital (such as oil, minerals, land, and forests), human capital, and net foreign assets. Human capital wealth is by far the largest component of countries' wealth, accounting globally for two-thirds of total wealth. It is defined as the discounted value of the future earnings of a country's labor force. In practice, it is estimated using household surveys that capture (i) the probability that individuals are working, depending on their age, sex, and years of education; and (ii) their likely earnings when working, again, by age, sex, and years of schooling.

Table B1.1 provides the estimates of wealth per capita for Pakistan from 1995 to 2014. Wealth per capita increased from just under US\$15,000 in 1995 to almost US\$22,200 in 2014. The largest increase by far was observed for human capital, which accounted for 46 percent of total wealth in 1995, and 61 percent of total wealth in 2014. The growing share of human capital in Pakistan's national wealth underscores the importance of investing in people through appropriate policies addressing education, health, nutrition, population, labor markets, and social protection.

**Table B1.1 Wealth per Capita, 1995–2014**

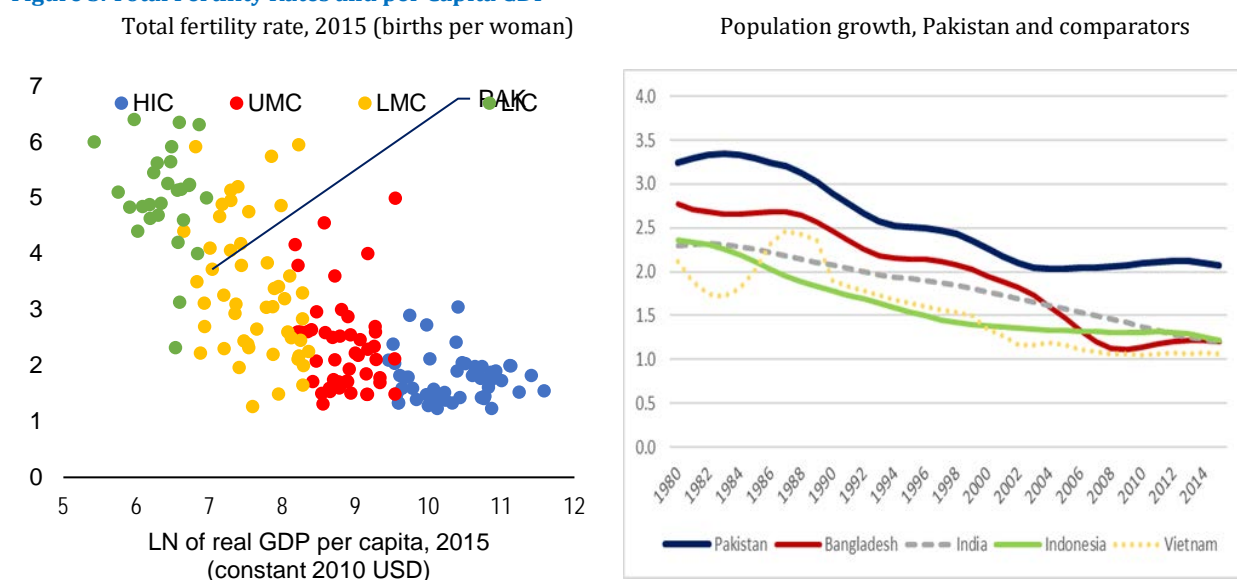
Wealth Per Capita, Constant 2014 US\$	1995	2000	2005	2010	2014
<b>Total wealth</b>	<b>14,998</b>	<b>18,704</b>	<b>19,482</b>	<b>20,364</b>	<b>22,182</b>
<b>Produced capital (incl. urban land)</b>	<b>2,719</b>	<b>2,282</b>	<b>2,888</b>	<b>2,778</b>	<b>3,029</b>
<b>Natural capital</b>	<b>5,811</b>	<b>5,816</b>	<b>5,193</b>	<b>5,518</b>	<b>5,982</b>
Forests, timber resources	17	11	10	10	10
Forests, non-timber resources	5	4	3	3	2
Protected areas	351	350	321	359	345
Land	5,351	5,350	4,608	4,786	5,332
Cropland	1,654	1,607	1,422	1,574	1,572
Pastureland	3,697	3,743	3,187	3,212	3,759
Sub-soil assets	88	101	251	360	294
Fossil energy resources	86	101	246	339	274
Oil	41	39	74	105	104
Natural gas	32	52	154	206	150
Coal (all grades)	13	9	19	27	20
Metals and minerals	2	0	5	21	19
<b>Human capital</b>	<b>6,931</b>	<b>11,032</b>	<b>11,723</b>	<b>12,505</b>	<b>13,587</b>
<b>Net foreign assets</b>	<b>-463</b>	<b>-426</b>	<b>-322</b>	<b>-437</b>	<b>-416</b>
<b>Share of total wealth</b>					
Total wealth (%)	100	100	100	100	100
Produced capital (including urban land) (%)	18	12	15	14	14
Natural capital (%)	39	31	27	27	27
Human capital (%)	46	59	60	61	61
Net foreign assets (%)	-3	-2	-2	-2	-2

Source: Lange, Wodon, and Carey 2018.

## 1.3 HOW CAN HUMAN CAPITAL MAKE A DIFFERENCE TO PAKISTAN'S GROWTH TRAJECTORY?

Compared to other countries at similar levels of income per capita, Pakistan has a relatively higher total fertility rate and persistently high population growth rates (Figure 5). As countries develop, they tend to move through the various phases of the demographic transition process, whereby populations move from high to low fertility and mortality rates (Szreter, 1993). In countries with low levels of income and education, birth rates and mortality rates are relatively high, contributing to low life expectancy. In the first stage of the demographic transition, the increase in the number of children is proportionally larger than increases in the working-age population, or the elderly, leading to a decrease in the share of the working-age population. As income and education improves, fertility and mortality rates decline, and there is an increase in the share of the working-age population. This is the stage of the demographic transition that provides the initial conditions for the demographic dividend. The third stage of demographic transition happens when the fertility rate is low—usually below the replacement rate—and the mortality rate is also low, which leads to high life expectancy.<sup>3</sup> At this stage, the growth of the elderly population more than compensates for the reduction in the share of children, leading to an increase in the total dependency ratio, driven by a larger number of elderly people.

**Figure 5. Total Fertility Rates and per Capita GDP**



Source: Authors' estimates, based on total fertility rate data from the UN WPP 2017 Revision and real gross domestic product (GDP) per capita data from the World Development Indicators. Note: HIC = high-income countries; UMC = upper-

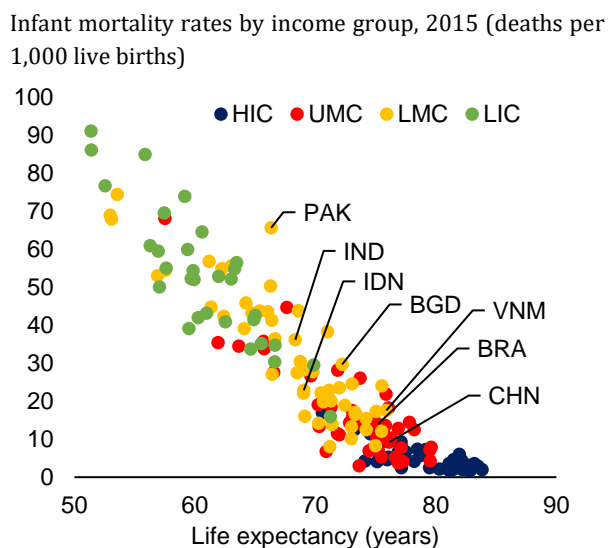
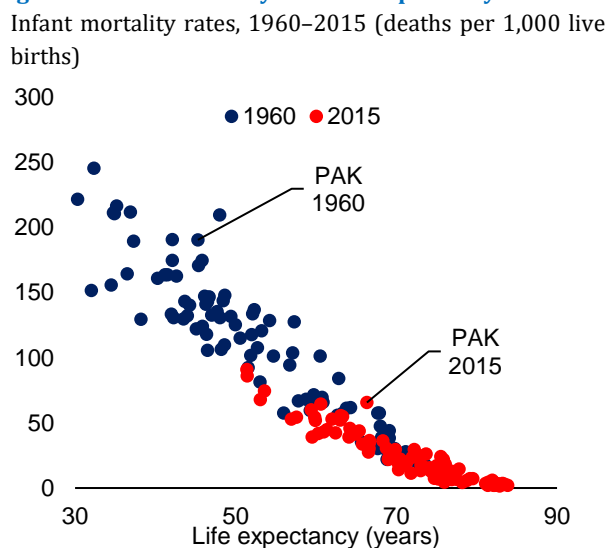
<sup>3</sup> The replacement rate is the total fertility rate that would be required to maintain a constant population. Estimates of the replacement rate vary, but it is generally considered to be 2.1.

middle-income countries; LMC = lower- and middle-income countries; LIC = low-income countries, following the World Bank Group’s income-based country classification system for FY 2018.

**Declining infant mortality rates and increasing educational attainment, life expectancy, and income are all associated with reductions in total fertility rates.**<sup>4</sup> Reher (2011), Soares (2005), and Acemoglu and Johnson (2007) discuss the importance of infant mortality to fertility. Empirical studies do not agree on the main determinants of long-term demographic transition. However, Murtin (2013) finds that education is more robust than infant mortality, income, and other variables in determining fertility transition. Herzer, Strulik, and Vollmer (2012), on the other hand, suggest that mortality changes and income growth are the most important drivers of changes in fertility rates, while Angeles (2010) suggests that reductions in fertility are driven mostly by reductions in mortality.

**Pakistan’s infant mortality rates have fallen and life expectancy has increased, but the country lags behind its peers, highlighting its position at a relatively early stage of the demographic transition process (figure 6).** At the same time, education (especially of females) and household income are negatively correlated with fertility. As women become more educated, the opportunity cost of not participating in the labor market rises, leading to either fewer or later births. The presence or absence of gender empowerment also plays a role in the participation of women in the labor force. More directly, as girls remain in school for longer, their age at first marriage and first childbirth tend to fall, leading to a lower lifetime number of childbirths. While higher educational attainment and household income are both associated with declines in fertility, the importance of education (particularly primary education) in affecting fertility seems to be more robust in analyses that aim to identify a causal relationship between fertility and education.

**Figure 6. Infant Mortality and Life Expectancy**



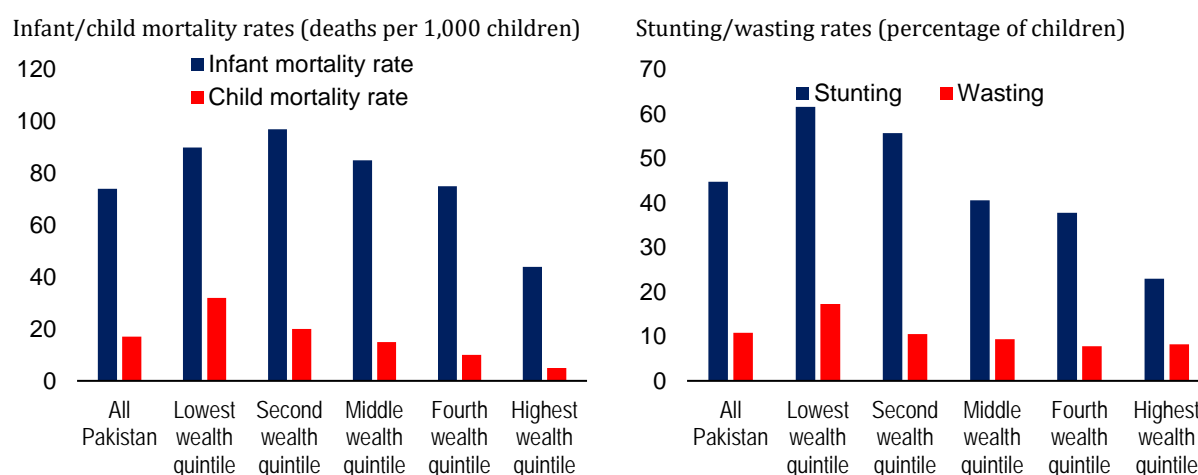
*Source:* Authors’ estimates, based on total fertility rate data from the UN WPP 2017 Revision and real gross domestic product (GDP) per capita data from the World Development Indicators. *Note:* HIC = high-income countries; UMC = upper-middle-income countries; LMC = lower- and middle-income countries; LIC = low-income countries, following the World

<sup>4</sup> World Bank (2015) and Ahmed et al. (2016a) review the literature on the drivers of demographic change.

Bank Group’s income-based country classification system for FY 2018. BRA=Brazil; BGD=Bangladesh; CHN=China; IND=India; IDN=Indonesia; VNM=Vietnam.

**The mortality and well-being of infants and children are correlated with the relative wealth of their households.** Households with greater wealth tend to have not only lower infant and child mortality rates, but also lower rates of wasting and stunting (Figure 7). As more children survive infancy and childhood, parents reduce the number of births to maintain the same number of surviving children. A reduction in infant mortality rates generally has a lagged effect on reducing fertility, largely because of changes in reproductive decisions that might otherwise be based on “replacing” deceased children and providing “insurance” against those who may not survive to adulthood.

**Figure 7. Infant and Child Health and Nutrition Outcomes by Wealth of Households**



*Source:* Authors’ estimates, based on data from the Pakistan Demographic and Health Survey 2012–13. *Notes:* The infant mortality rate is the probability of children dying before their first birthday in the 10 years preceding the survey per 1,000 live births. The child mortality rate is the probability of dying between the first birthday and the fifth birthday in the 10 years preceding the survey per 1,000 children surviving to their first birthday. Stunting is defined as being two standard deviations below the WHO standard height for age. Wasted is defined as being two standard deviations below the WHO standard weight for age.

**Progress in the areas of health, nutrition, education, and female empowerment thus does not only represent development progress in and of itself, but could also accelerate income per capita growth as well.** There is a close link between the demographic transition and demographic dividends, with growth in the working-age share generally associated with higher per capita income growth (Figure 8).<sup>5</sup> Overall, the positive effect of a larger share of working-age population on growth is widely supported in the literature, including its key role in East Asian economies’ rapid growth in the last century. Evidence from Bangladesh suggests that demographic factors, including age structure, gender, and regional distributions of populations, accounted for a quarter of the rapid reductions in poverty that occurred between 2000 and 2010 (World Bank, 2013a). Most recently,

<sup>5</sup> The large and substantive literature on this topic is reviewed in World Bank (2016), Ahmed and Cruz (2016), and Cruz and Ahmed (2016, forthcoming). This literature includes Bloom and Williamson (1998), Bloom et al. (2000, 2007), Higgins and Williamson (1997), Eastwood and Lipton (2011), Kelley and Schmidt (1995, 2005, 2007).

using data from 160 countries, Cruz and Ahmed (2018) estimate that an increase of 1 percentage point in the share of the working-age population is associated with an increase of 1.60 to 2.44 percentage points in GDP per capita growth, on average, depending on other economic and social factors such as trade openness, institutional quality, geographic colonial history, and education being taken into account. A reduction of 1 percentage point in the child dependency ratio (CDR) is associated with an increase of 0.23 to 0.61 percentage points in per capita income growth.

**Figure 8. Working-Age Population Share and GDP Growth**

Average annual percentage point change in real GDP per capita, 1960–2014



*Source:* World Bank 2015. *Note:* Data for 160 countries from the World Development Indicators, Penn World Table, Barro and Lee (2013), and World Population Prospects.

**Changes in age structure are also associated with changes in labor productivity over time.** As countries move from earlier stages of the demographic transition process to more advanced stages, the fiscal space for households and societies change, allowing for greater investment in physical and human capital. More specifically, as the child dependency ratio of households falls, the resources available for investing in children’s education and nutrition increase. At the societal level, there is scope for increasing social sector spending per capita. Due to changes in age structure, there is a possibility for an acceleration in income per capita growth rates (i.e., the demographic dividend), which in turn can potentially increase government revenues, and increase the fiscal space for health and education spending. Collectively, these investments can increase the productivity of future workers. Cruz and Ahmed (2018) estimate that a 1 percentage point change in output per worker is associated with a 0.5 to 0.76 percentage point change in the child dependency ratio.

**Comparing several possible scenarios can illustrate how progress in human development outcomes— that lead to reductions in total fertility rates and improvements in education— can accelerate the growth of income per capita.** Based on the economic simulations of Ahmed et



al. (2016b), the impact of changing total fertility rates and educational outcomes is considered.<sup>6</sup> Growth in the model is driven by changes in the labor supply, investment, and productivity between 2018 and 2047, which are in turn influenced by demographic changes and decisions about human capital investments. From a demographic perspective, they span high-, low-, and medium-fertility scenarios till 2047, as outlined in the UN World Population Prospects 2017 Revision (WPP). From an education perspective, the scenarios consider illustrative paths of improvement, where the share of the population with at least nine years of schooling rises from its current share of less than 30 percent to at least 55 percent. That is, the “skill share” of the labor supply would converge to at least that of Brazil and South Africa. The education scenarios also consider one case where labor productivity doubles.

**The scenarios considered here are designed to allow for comparison of the impact of deviations in key assumptions around demographics and education from a baseline, business-as-usual scenario.** The scenarios are described in table 1. The first is a “business-as-usual” trajectory for the economy in 2018–47, in which the skill share remains constant and fertility declines following the UN WPP’s medium-fertility scenario. At the baseline, the average annual GDP growth rate in 2018–47 is 3.6 percent, insufficient to help Pakistan reach middle-income status by 2047. The baseline is calibrated to long-run growth projections put forward by the World Bank’s Global Economic Prospects. The second scenario is more pessimistic, with the skill share remaining constant over time, but the age structure following the UN WPP’s high-fertility scenario. The third scenario is the same as the baseline, but with the low-fertility scenario considered. The fourth scenario considers the low-fertility scenario but is coupled with the skill share rising to 55 percent by 2047. These last scenarios consider labor productivity to be growing at the same rate as in the baseline. The final scenario considers all the features of the fourth scenario, but with labor productivity growth doubling.

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<sup>6</sup> Appendix B describes the simulation modeling framework.

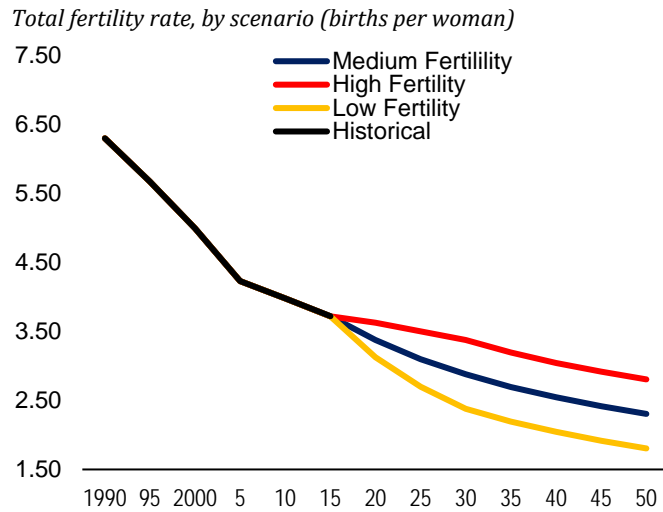
**Table 1. Illustrative Scenarios and Key Assumptions, 2018–47**

Scenario	Description	Fertility Scenario	Share of Labor Supply with at Least 9 Years of Schooling in 2047	Labor Productivity Acceleration
1	Business-as-usual	Medium median fertility	30	-
2	High fertility	High fertility	30	Same as business-as-usual
3	Low fertility	Low	55	Same as business-as-usual
4	Low fertility with rapid education attainment	Low	55	Same as business-as-usual
5	Low fertility with rapid educational attainment and doubled productivity growth	Low	55	Double that of business-as-usual

Source: Authors' compilation.

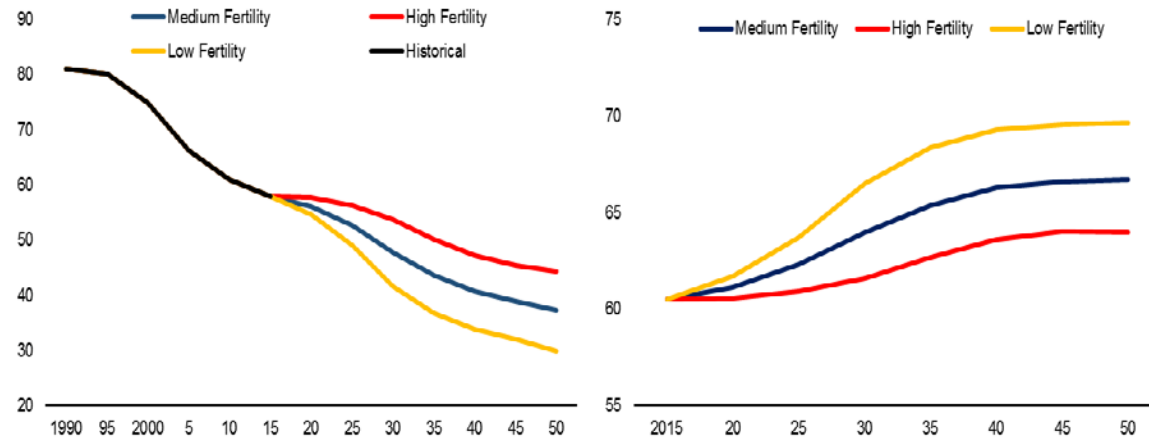
**There is a one-child-per-family difference between the high- and low-fertility scenarios of the UN WPP by 2050, which would lead to substantial differences in Pakistan's age structure.** Under the medium-fertility scenario, Pakistan's total fertility rate is expected to decline to 2.3 from 3.72 in 2015, with the share of the working-age population continuing to rise to 66.7 percent (up from 60.5 percent in 2015) and the child dependency rate declining to 37.3 percent (down from 57.9 percent in 2015) (Figure 9 and Figure 10). Under the low-fertility scenario, the share of the working-age population rises as high as 69.7 percent and continues to rise past 2050. In contrast, under the high-fertility scenario, Pakistan's working-age population not only peaks before 2050, but the magnitude of the peak is also lower than the peaks in the medium- and low-fertility scenarios. Given the centrality of the share of the working-age population to the size and duration of the demographic dividend, Pakistan's boost to income per capita from demographic change is likely to be more modest under the high-fertility scenario than the scenarios characterized by lower fertility.

**Figure 9. Pakistan's Fertility Rate Scenarios by 2050**



Source: Authors' estimates, based on data from UN WPP 2017 Revision.

**Figure 10. Child Dependency Ratio and Working-Age Population Share, by Fertility Scenario**



Source: Authors' estimates, based on data from UN WPP 2017 Revision.

**The five illustrative scenarios suggest that demographic change will need to be accompanied by improvements in educational attainment and labor productivity for income growth to allow Pakistan to reach upper-middle-income status by 2047 (Figure 11).** The pessimistic high-fertility scenario has the slowest GDP growth rate. When we compare real GDP per capita growth, we see that the difference from the baseline is even lower. This is because the total population is larger than in any other scenario, with a greater share of children. The low-fertility scenario and the low-fertility scenario with greater educational attainment (and subsequently a higher skill share) have faster average annual growth rates of GDP and real GDP per capita than the baseline. This is through two channels. First, lower child dependency ratios increase households' propensity to save, subsequently boosting investment and accelerating the pace of capital accumulation. Second, a

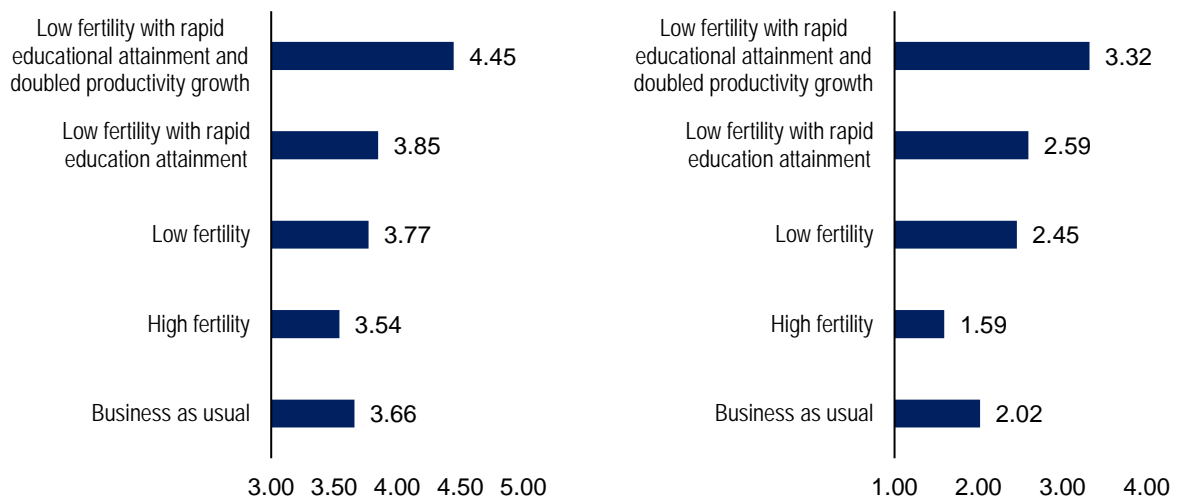
higher proportion of skilled workers are able to enter higher-value sectors that tend to use workers with higher skills.

**As a result, these sectors grow faster than lower-value sectors that used less-skilled workers more intensively.** In the scenario with the fastest growth, and the only one where the growth rate is sufficient to help Pakistan reach upper-middle-income status by 2047, lower fertility is accompanied by not just improvements in educational attainment but extremely high labor productivity growth. Such productivity growth would have to be facilitated by substantial improvements in the quality of education as well as in the early childhood development of future workers. Reducing fertility rates, raising educational attainment, or increasing the quality of education would thus not be enough to reach the target growth rate, unless they are all done together, and the demographic dividend is not a foregone conclusion.

**Figure 11. Human Capital and Real GDP per Capita Growth**

Average annual GDP growth rates, by scenario, 2018–47 (percentage)

Average annual real GDP per capita growth rates, by scenario, 2018–47 (percentage)

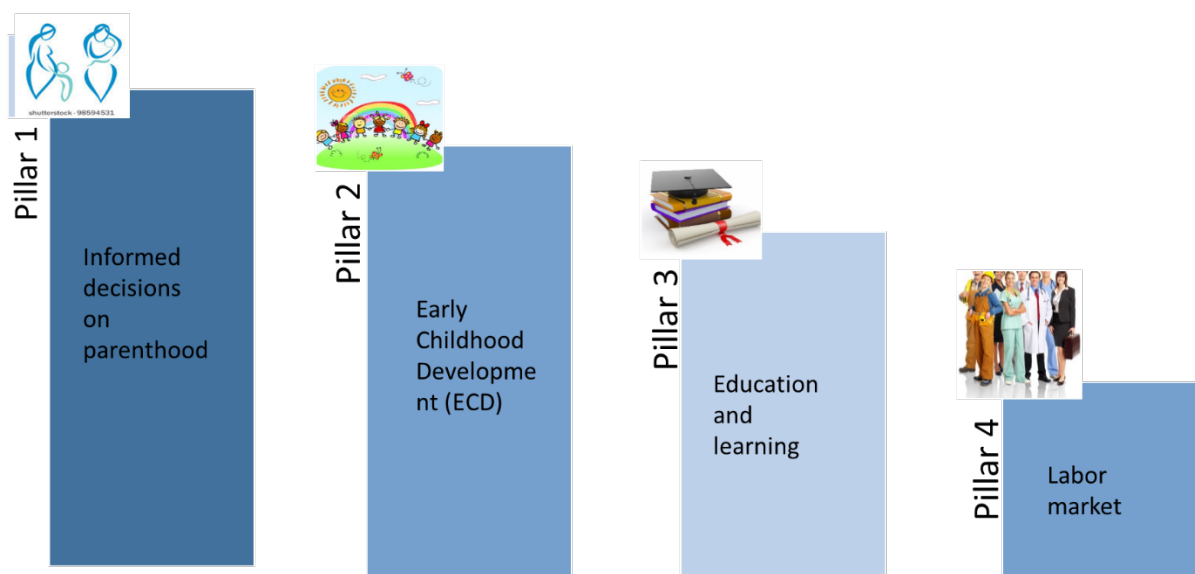


Source: Authors' estimates.

## CHAPTER 2: FOUR PILLARS OF HUMAN CAPITAL

A simple conceptual framework consisting of four critical pillars of human capital accumulation can help policy makers design and implement key policy measures to boost human capital and labor productivity (Figure 12). The life-cycle approach—building on the Skills toward Employment and Productivity (STEP) framework—highlights the importance of early intervention, since the returns to investment are larger for investments made at earlier stages of the life cycle. While the pillars are presented separately, it is worth noting that these policy areas are very much interconnected, given the continuous nature of human capital accumulation.

Figure 12. Pillars of Human Capital



Source: Authors' compilation.

### 2.1 PILLAR 1: INFORMED DECISIONS ON PARENTHOOD

**High fertility rates and rapid population growth tend to be associated with high poverty and slow economic growth rates.** Conversely, countries with declining fertility rates witness lower dependency ratios, creating a window of opportunity for enhancing human capital development and economic growth, as highlighted above. Providing access to reproductive health services is the first stepping stone in the life cycle of human capital accumulation. Reproductive health—broadly defined as the use of effective contraception, informed decisions about parenting and access to family planning services, and use of health care during pregnancy and childbirth—lowers fertility and improves maternal and child health, creating a pathway toward economic growth.

**As women have better access to high-quality reproductive health information and services, their overall health and their children's health tend to improve.** Evidence reveals that women

who delay, space, or limit childbirth have more opportunities to allocate their time and resources toward investing in each child's health and education, leading to reduced fertility rates, higher birth weights, lower levels of child mortality, better child nutrition, and improved cognitive development. In Matlab, Bangladesh, for example, mothers in designated treatment areas received access to integrated family planning and maternal and child health services over a 20-year period. Children from treatment areas achieved higher test scores than their peers from comparison areas where women did not receive improved services (Barham 2009). In addition, declines in fertility and improved maternal health ultimately contributed to an increase in children's educational attainment (Sinha 2005).

**Lower fertility and better reproductive health are associated with greater female labor force participation.** First, family planning and access to reproductive health services help women to better control the timing and number of births. Improving a woman's capacity to regulate her fertility and to plan childbearing allows her to redirect resources toward schooling, job training, and working outside the home. Second, children who benefited from their mother's quantity-quality trade-offs may also be presented with greater labor market opportunities in the future (Joshi 2012). One study of 97 countries found that higher fertility is associated with the lower labor force participation of women aged 20–39 (Bloom et al. 2007). In Colombia, evidence suggests that women who had access to family planning as teenagers completed about half a year more of schooling over their lifetimes, and were 7 percent more likely to work in the formal sector (Joshi 2012). In Sri Lanka, a 70 percent drop in maternal mortality risk between 1946 and 1953 led to increases in female literacy by 2.5 percent and female years of education by 4 percent (Jayachandran and Lleras-Muney, 2008).

**Starting families off on the right foot through fostering informed decision making on child birth and parenting can contribute to human capital accumulation across generations.** However, to ensure that reproductive health policies effectively contribute toward economic growth, countries have to offer complementary interventions throughout the life cycle, as will be further discussed below.

## 2.2 PILLAR 2: STRONG START THROUGH EARLY CHILDHOOD DEVELOPMENT

**The skills developed in early childhood, from birth to primary school entry, form the basis of future learning and labor market success.** The process of skill formation is dynamic and builds on itself. Fostering early-life skills facilitates the accumulation of skills over the life cycle, where future skills have intergenerational impacts. These dynamic relationships make early life an important period, foundational to building skills later in life (Garcia and Saavedra. 2017). Early childhood development (ECD) enhances a child's ability to learn, to work with others, to be tolerant and persistent, and to develop a wide range of other foundational skills for formal learning and interactions in the school years and beyond.

**The window of opportunity is small and failing to invest in ECD is costly to compensate for later in life.** Research demonstrates that the effects of adverse early childhood environments persist over a lifetime. For example, health status during the prenatal period and the first 24 months after birth is strongly associated with later cognition, executive function,<sup>7</sup> and school attainment. In Pakistan, height, as a proxy for nutrition, has been documented to have a statistically positive relationship with earnings (World Bank 2014).

**Many countries have introduced important interventions for early childhood health and nutrition, particularly for the poor and vulnerable.** Conceptually, the foundation of all interventions is to create stable and predictable early childhood experiences. High-quality ECD programs enrich the learning and nurturing environments of disadvantaged children. Interventions include ensuring the health and nutrition of pregnant and lactating mothers; providing immunizations and regular health checkups for mothers and children; encouraging exclusive breastfeeding, and the cognitive and linguistic stimulation of young children; promoting childcare services and early childhood education; and providing homeschool resources.

**The importance of investing in the early years is well established by an overwhelming amount of evidence.** Children who participate in high-quality ECD programs have higher cognitive development and overall school readiness upon primary school entry, lower repetition and dropout rates in the early grades, greater learning in school, and higher school completion rates.

- In Bangladesh, children who received center-based preschool education outperformed their peers by 58 percent on a standardized test of school readiness (Aboud 2006).
- In Colombia, children who received a comprehensive community-based ECD intervention were 100 percent more likely to be enrolled in third grade, indicating lower dropout and repetition rates for program children (World Bank 2013c).
- In Argentina, one year of preschool was estimated to increase the average third-grade test score in mathematics and Spanish by 8 percent (Berlinski, Galiani, and Gertler 2006).
- In a long-term evaluation of children's exposure to Mexico's Prospera program, researchers found positive impacts on educational attainment, high school completion, and likelihood of quality employment (Kugler and Rojas 2018)
- In Jamaica, early stimulation interventions for infants and toddlers increased their future earnings by 25 percent (Gertler et al. 2014).

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<sup>7</sup> Executive function is responsible for a number of skills: paying attention, planning and prioritizing, and completing tasks.

## 2.3 PILLAR 3: EDUCATION AND LEARNING FOR ALL

**A good-quality and relevant education is a fundamental element of the life cycle of human capital development.** The acquisition of later skills and learning in middle childhood through adolescence and adulthood builds on foundational capacities established between preconception and early childhood. Adequate foundational skills to be accumulated through schooling are essential for further skills accumulation.

**Gaps in foundational skills affect not only the starting points of new workers entering the labor market but also their growth trajectories.** Worldwide, many students leave school without mastering the key cognitive skills that underpin the development of higher-order cognitive, technical, and specialized skills. This skills deficit limits opportunities for further education or training because the capacity to make up for lost skills shrinks over time. The implications, already profound, will be felt more acutely as jobs continue to shift from physical to more cognitive or socioemotional tasks. Mounting evidence shows that the skills acquired in school are what drive growth and equip individuals for work and life (World Bank 2018a). Individuals with low literacy proficiency are poorly prepared for the labor market, further education, and on-the-job training. In rapidly modernizing labor markets, adults with higher proficiency in literacy, numeracy, and problem solving tend to have better outcomes in the labor market than their less-proficient peers. They have greater chances of being employed and, if employed, of earning higher wages (OECD 2016). For individuals, one additional year of schooling raises earnings by 10–20 percent in low-income countries, and better-quality schooling raises earnings even more (World Bank 2010).

**Despite the evidence, learning outcomes, especially in developing countries, are dangerously low.** Globally, 125 million children are not acquiring functional literacy or numeracy, even after spending at least four years in school (World Bank 2018a). With poor learning outcomes it will not be possible for school enrollment to translate into labor productivity and economic growth, since poor-quality learning in the early years of life manifests itself in inputs at the tertiary level of education.

**Countries need to foster innovation and entrepreneurship to fully reap the benefits of human capital accumulation.** Education and training systems support individuals to be cognitively developed, creative, and entrepreneurial. Both creativity and entrepreneurial skills can be incorporated into teaching methodologies at all points of the skill formation process. And education systems can encourage innovation-related specialties, such as math, science, and business and managerial skills. In Pakistan, although the youth entering the labor market enjoy better cognitive skills than older workers, they lack entrepreneurial and technical skills. The prevalence of on-the-job training is minimal, both in formal and informal enterprises (World Bank 2014).

**Countries with lagging learning outcomes have to prioritize the development of strong systems with defined learning standards for teaching and instruction, adequate resources, and a strong regulatory environment for education.** The World Development Report 2018 outlines four key determinants for securing higher learning standards. These include:



- (i) *Learner preparation*: Ensuring that children acquire the right foundational skills in early childhood to prepare them for learning.
- (ii) *Teacher skills and preparation*: Ensuring that teachers are professionally trained and motivated to deliver high-quality instruction.
- (iii) *Availability of relevant inputs*: Ensuring that learning resources are commensurate with any increase in school quantity and enrollment numbers.
- (iv) *School management and governance*: Ensuring that there is capacity and autonomy for decision making at the school level.

## 2.4 PILLAR 4: LABOR PRODUCTIVITY

**Labor productivity is determined by the level and quality of human capital, an ability to continue strengthening human capital (e.g., innovation), and the availability of complementary inputs for production (e.g., capital).** Higher labor productivity can translate into economic growth when it is combined with an overall economic environment conducive to job creation, effective utilization of human capital, and an efficient market for resource allocations. Individuals can further accumulate human capital in the labor market through learning by doing. Workers often learn to innovate and move to higher-performing jobs in the labor market.

**Even if individuals have the skills to be productive and creative, employment and productivity can be hampered if labor markets do not function well.** Governments need to facilitate labor mobility, boost labor force participation, and improve the matching of skills and jobs. In Pakistan, although 90 percent of males participate in the labor force, female labor force participation rates are among the lowest in the world. One in four women participates in the labor force in rural areas and only one in twelve women does so in urban areas (World Bank 2014). The unemployment rate among urban females is high, over 10 percent among women aged 15 to 24. In addition, with large numbers of Pakistani youth entering the workforce each year, there is evidence that many do not have the necessary skills that firms in the formal sector seek. The average worker has three to four years of schooling (World Bank 2014). Governments can facilitate labor mobility and job searches through various interventions, including a better combination of job and income protection policies and more proactive approaches to employment services and skills certification (World Bank 2010). Reallocation from low- to high-productivity jobs also matters for growth in developing countries, where differences in productivity across sectors and within sectors are wide (World Bank 2013b).

## CHAPTER 3: A HUMAN CAPITAL DIAGNOSTIC OF PAKISTAN

**Human capital outcomes are determined by various factors, including access, provision, and the quality of services conducive to human capital investment.** For instance, poor school outcomes may be due to a combination of factors such as lack of schools, inability of households to send children to school, or poor quality of education services. These factors are in turn determined by the policy environment, touching on, for example, budget allocation, social norms, or governance structure. With respect to labor market outcomes, which reflect the utilization of human capital, a host of factors—including macroeconomic conditions, investment climates, and labor market structure—could make a difference.

**This chapter analyzes both the evolution and current status of human capital investment and utilization in Pakistan, and also discusses several determining factors.** In analyzing these, we focus on disparities across provinces, gender, and income groups, and trends over time along these dimensions.

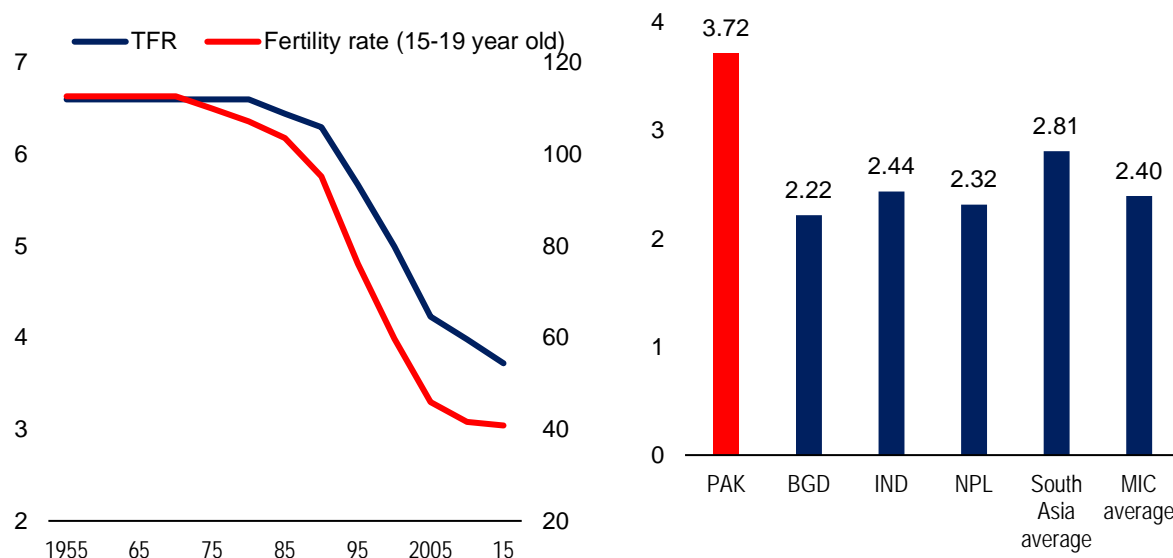
### 3.1 INFORMED DECISIONS ON PARENTHOOD

**Pakistan experienced a steady decline in fertility between 1970 and 2015, measured by both total fertility and adolescent fertility rates; but progress was not evenly achieved (Figure 13).** While rapid fertility declines were observed in the 1990s, fertility rates have leveled off since the early 2000s. In 2015, women in Pakistan had an average of 3.6 children, a figure that is higher than in many regional counterparts. Considerable disparity in fertility rates persists across regions—women in urban areas have 3.2 children on average, compared with 4.2 children per woman in rural areas. At the province level, fertility is highest in Balochistan, where women have an average of 4.2 children compared with Punjab, where the average is 3.8 children. Teenage fertility has also exhibited a marked decline—the share of adolescent women aged 15–19 that were already mothers or pregnant with their first child, fell from 16 percent in 2006 to 8 percent in 2012–13 (DHS 2012–13), with significant cross-provincial variations. The data also suggest a strong correlation between household wealth and adolescent fertility—adolescents in the bottom wealth quintile (12 percent) are more likely to have begun childbearing than those from households in the top wealth quintile (3 percent).

**Figure 13. Total and Adolescent Fertility Rates over Time and across Countries**

Total fertility rate (births per woman, left axis) and fertility rates for 15- to 19-year-old women (births per 1,000 women)

Total fertility rate, by country and region in 2015 (births per woman)



Source: Authors' estimates, based on data from UN WPP 2017 Revision.

Note: TFR = total fertility rate; PAK = Pakistan, BGD = Bangladesh, IND = India, and NPL = Nepal. The South Asia average refers to the average total fertility rate for the aforementioned countries as well as Afghanistan, Bhutan, the Maldives, and Sri Lanka. MIC = middle-income country, based on the World Bank Group's income-based country classification for FY 2018.

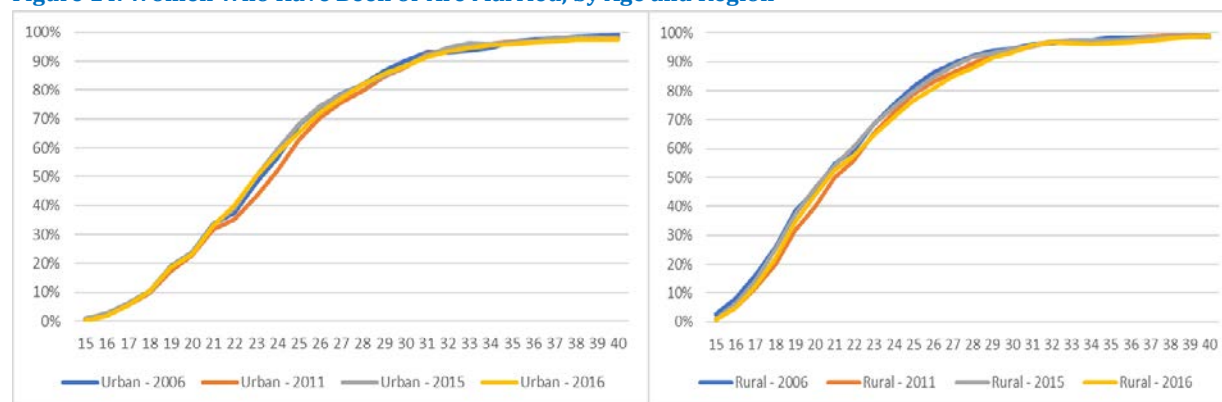
**In the context of Pakistan, where out-of-wedlock childbearing is limited, the fertility rate is determined by factors such as the age at first marriage, marriage rate and the total number of children born to married women.** Women who marry at a very young age have a higher number of childbearing years, and hence higher total fertility than women who marry older. A host of other factors come into play, including lower educational levels and limited understanding of family planning methods, which contribute to higher fertility. Evidence also exists linking adolescent marriage to a power imbalance and a lack of agency in asserting preferences for contraceptive use. Women aged 35–49, who married after 18 years of age, have on average 4.5 live births. In contrast, women who married before 18 years of age have an average of 6.1 births.<sup>8</sup> Onagoruwa and Wodon (2017) estimate that a reduction in the incidence of child marriage is likely to lead to a fall of 0.53 in the total fertility rate, equivalent to an almost 10 percent fall. The total number of children of married women is a function of contraceptive use, spacing between births, a preference for sons, and voice and agency, among others.

**Data suggest that the average age at first marriage and marriage rate have not changed much for women in Pakistan, with the median age at first marriage increasing from 19.1 years in 2006–07 to 19.6 years in 2012–13 (DHS 2012–13).** Figure 14 provides a distribution of married

<sup>8</sup> Onagoruwa and Wodon (2017) estimate that the impact of females marrying at age 13 instead of 18 in Pakistan is a 31 percent increase in the number of births. The corresponding estimate of the impact of marrying at age 17 instead of 18 is a 20 percent increase in the number of live births.

women by age based on various years of the Pakistan Social and Living Standards Measurement (PSLM). Although urban women tend to be married slightly later than rural women, about 90 percent of women are married by age 30 in urban areas and 28 in rural areas. Moreover, early marriage is persistent in rural areas, with roughly 46 percent of women being married by age 20, and a quarter by age 18.

**Figure 14. Women Who Have Been or Are Married, by Age and Region**



Source: PSLM 2006, 2011, 2015; HIES 2016.

**The prevalence of contraceptive use in Pakistan (that is, the share of married women using modern contraceptive methods<sup>9</sup>) rose from 16 percent in 1990 to 38 percent in 2006, but declined to 26 percent in 2012 (DHS).** The low rate of contraceptive use is striking as knowledge of contraception is almost universal in Pakistan (almost 99 percent of women reported being aware of modern contraceptive methods). The considerable disparity in contraceptive prevalence rates across provinces, indicative of varying sociocultural constraints, is worth noting—with the rate highest in Punjab (29 percent) and lowest in Balochistan (16 percent), according to the latest DHS 2012–13. Modern contraceptive use also varies with women’s education—30 percent of married women with higher education use modern methods compared with 23 percent of married women with no education.

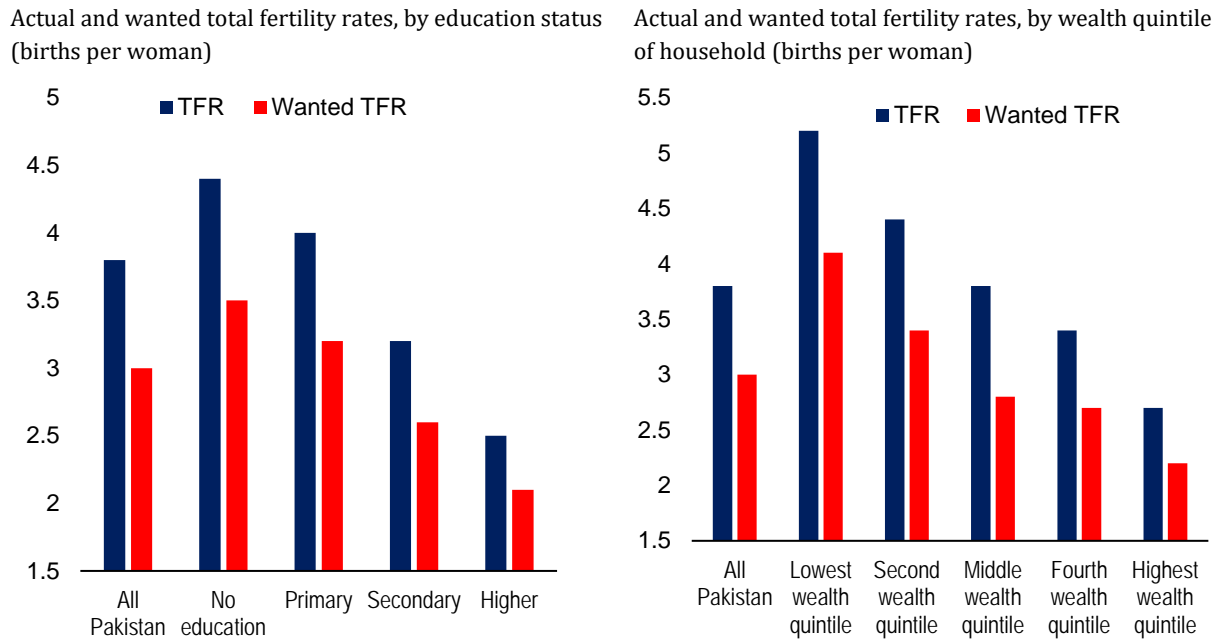
**There is a notable difference between desired and actual fertility rates, which may relate to overall gender empowerment (or lack thereof).** On average, actual fertility rates tend to be greater than the wanted ones, suggesting a failure of birth control (Figure 15).<sup>10</sup> The gap between the two tends to be larger for women from rural, less educated, and poorer households. Married men tend to want more children than their spouses, with the gap also being more prominent in Balochistan compared to Punjab. Around 37 percent of episodes of contraceptive use were discontinued within a year of initiation, with 10 percent of women citing side effects and health

<sup>9</sup> Modern methods of contraception include female and male sterilization, the pill, intrauterine devices (IUDs), injectables, implants, male condoms, the lactational amenorrhea method (LAM), the standard days method (SDM), and emergency contraception, whereas traditional methods include rhythm and withdrawal.

<sup>10</sup> This pattern holds from earlier rounds of the DHS survey, and suggests that there are persistent factors that restrain the ability of women to exercise agency in reproductive decisions. Bongaarts et al. (2013) review several possible reasons, including a lack of knowledge of contraception and sources of supply; low quality and limited availability of family planning services; cost of method, services, travel, and time; health concerns and side effects; objections from husbands or other family members; and concerns about moral and social acceptability.

concerns as the basis for discontinuation. One-fifth of currently married women reported an “unmet need” for family planning services. The incidence of an unmet need for family planning is highest in the lowest wealth quintile (25 percent) and in Balochistan (31 percent).

**Figure 15. Differences in Wanted and Actual Total Fertility Rates across Household Types**

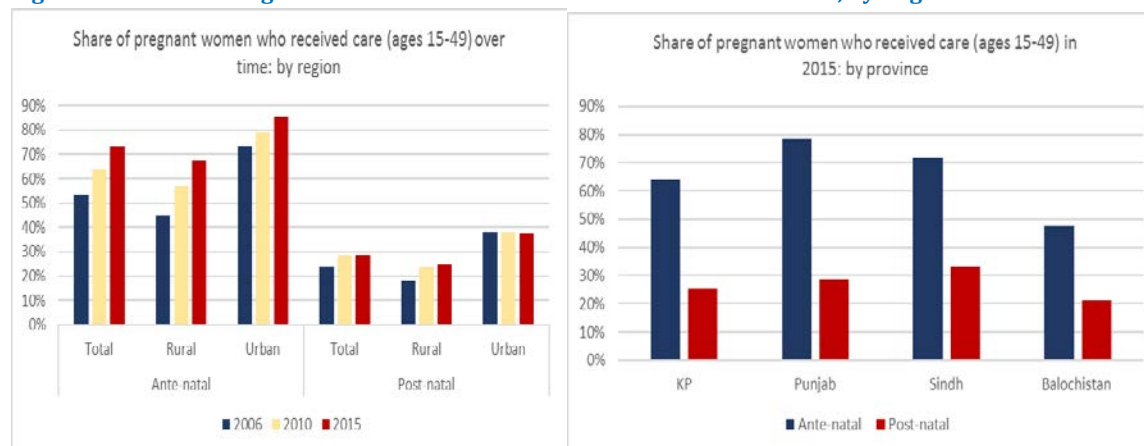


Source: Authors’ estimates, based on data from the Pakistan Demographic and Health Survey 2012–13.

Notes: TFR = total fertility rate.

Recognizing women’s empowerment issues and social constraints, during the 1990s, two prominent community-based family planning and women’s health programs—the Lady Health Worker Program and the Village-Based Family Planning Worker Scheme—were introduced. These programs addressed proximity and social constraints faced by women, by providing services at their doorsteps. At the same time, private sector family planning programs such as the Greenstar Network were introduced, which accounted for 35 percent of the contraceptive use reported in the DHS 2012–13. In part due to these programs specifically designed for women, the share of pregnant women receiving pre- and post-natal care has improved significantly over time, with a noticeable expansion among rural women (Figure 16).

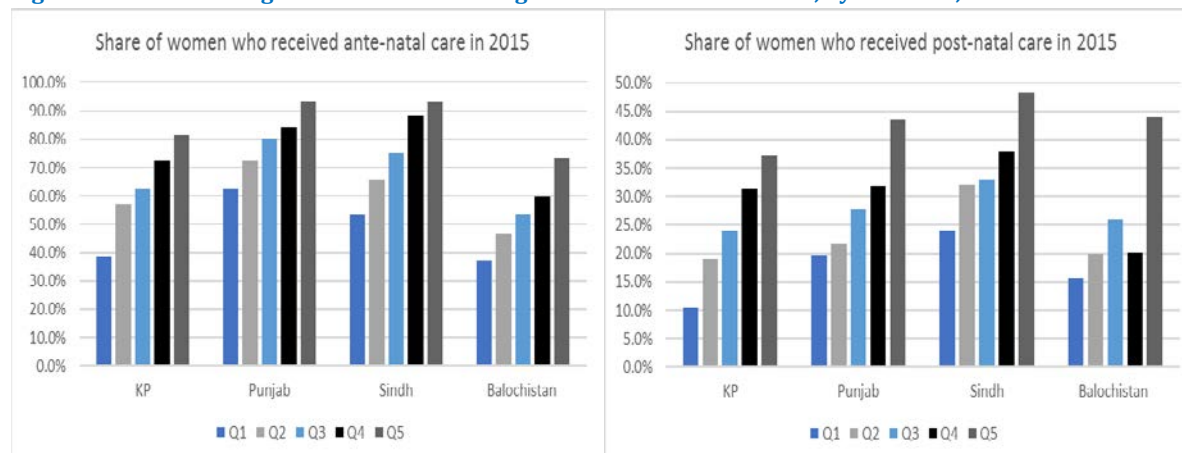
**Figure 16. Share of Pregnant Women who Receive Ante-and Post-natal Care, by Region and Province**



Source: PSLM, multiple years.

**However, there are substantial differences in mothers' access to care across provinces and income levels (Figure 17).** Provincial disparities are more pronounced for ante-natal care, with Punjab having the highest share of women receiving care (78 percent) versus Baluchistan (48 percent). The high level of ante-natal care masks differences in health-care use among pregnant women across different income groups. In Khyber Pakhtunkhwa and Balochistan, the share of women in the bottom quintile receiving ante-natal care is less than half of the share of women in the highest wealth quintile. The disparity between quintiles in both Punjab and Sindh is less marked, but still substantial. Trends in post-natal care show an even starker contrast between the wealth quintiles. The share of pregnant women receiving post-natal care in the highest quintile is three times as high as that of the lowest quintile. Such disparities are most likely due to the poor's limited access to health services. Such disparities perhaps also reflect demand-side constraints on health service utilization, in particular, due to the patriarchal social norms that are associated with constraints on the mobility of women.

**Figure 17. Share of Pregnant Women Receiving Ante- and Post-Natal Care, by Province, 2015**

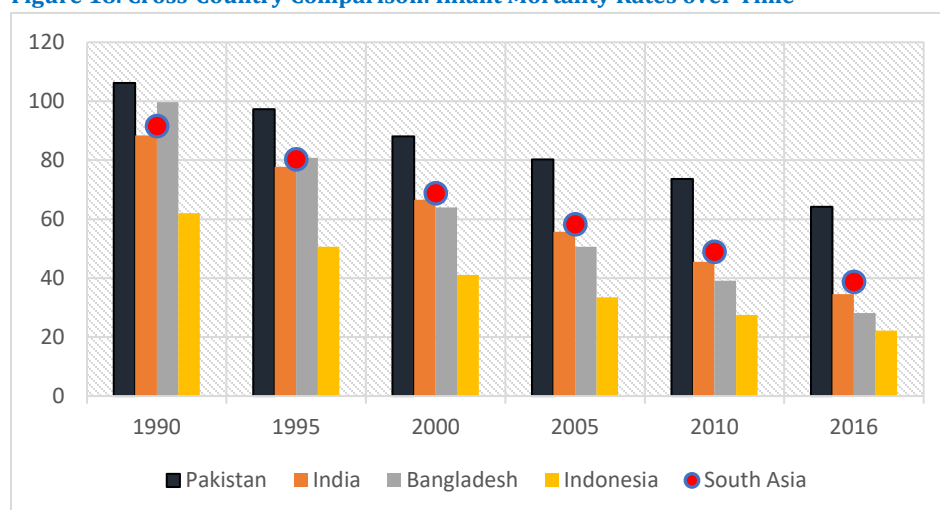


Source: PSLM 2015.

## 3.2 STRONG START THROUGH EARLY CHILDHOOD DEVELOPMENT

The key outcomes of interest in pillar 2 include indicators related to early childhood nutrition and health. There has been significant reduction in Pakistan’s infant mortality rates over time, but compared to other countries, the pace is slow and the level is significantly higher (Figure 18).

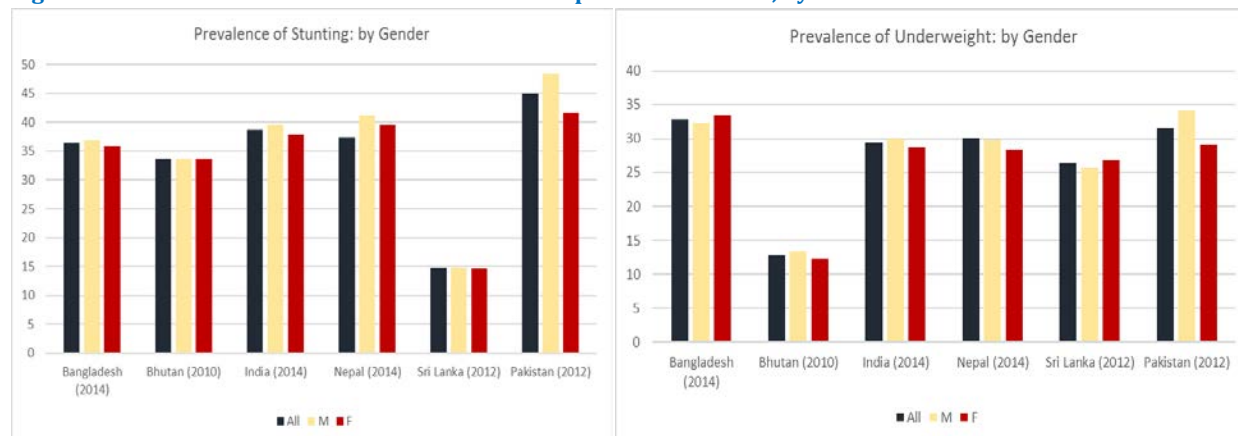
**Figure 18. Cross-Country Comparison: Infant Mortality Rates over Time**



Source: World Development Indicators.

Pakistan has the highest rate of child stunting (height for age) in the region (Figure 19), and indicators have remained largely stagnant over time. With respect to children’s underweight (weight for age), Pakistan still shows worse outcomes than many other countries in the region, although this gap is diminishing over time. Unlike many other countries, Pakistan also presents a noticeable difference in the stunting rate by gender: boys are more likely to be stunted than girls.

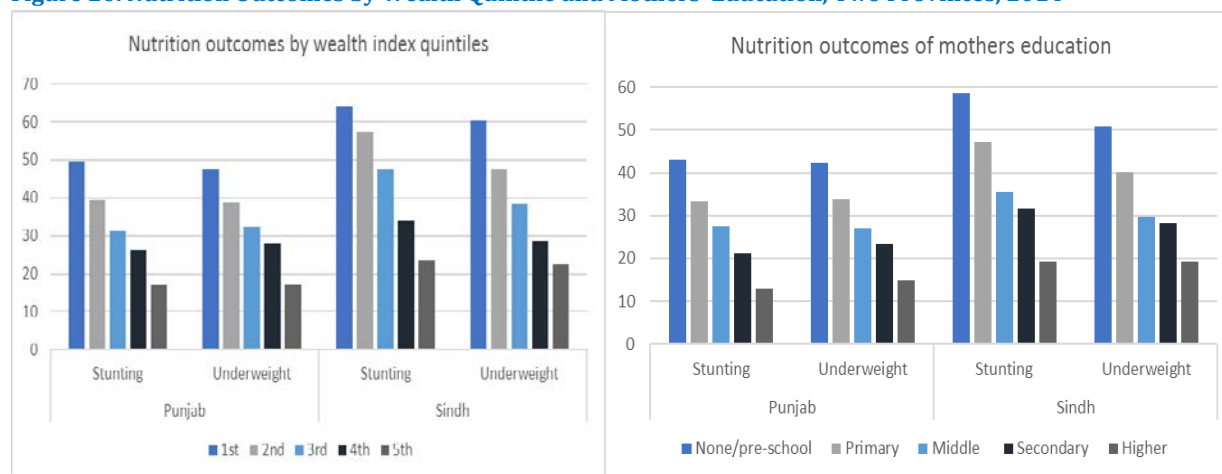
**Figure 19. Nutrition Outcomes in Pakistan and Comparator Countries, by Gender**



Source: World Development Indicators.

**According to the Multiple Indicator Cluster Survey (MICS) conducted in Punjab and Sindh in 2014, nutrition outcomes differ significantly across wealth quintiles (figure 20).** The gap between higher and lower wealth quintiles is significant in both provinces, suggesting that the poor bear the brunt of nutritional deficiencies. This suggests that poor nutrition is most likely a correlate of poverty, reflecting the inability of poor households to access basic health and nutrition services. In addition, parents' educational attainment, which is associated with household wealth, could explain the huge disparities in the nutrition outcomes across wealth quintiles. The MICS data show that children with less educated mothers have significantly higher stunting and underweight rates than those with better educated mothers. However, at the same time, it is striking that almost 15 and 20 percent of children are stunted in Punjab and Sindh, respectively, even when mothers have more than a secondary education or children belong to the highest wealth quintile households. This could reflect a general lack of awareness of diet and nutrition as well as of preferred feeding practices for the first 1,000 days of life.

**Figure 20. Nutrition Outcomes by Wealth Quintile and Mothers' Education, Two Provinces, 2014**

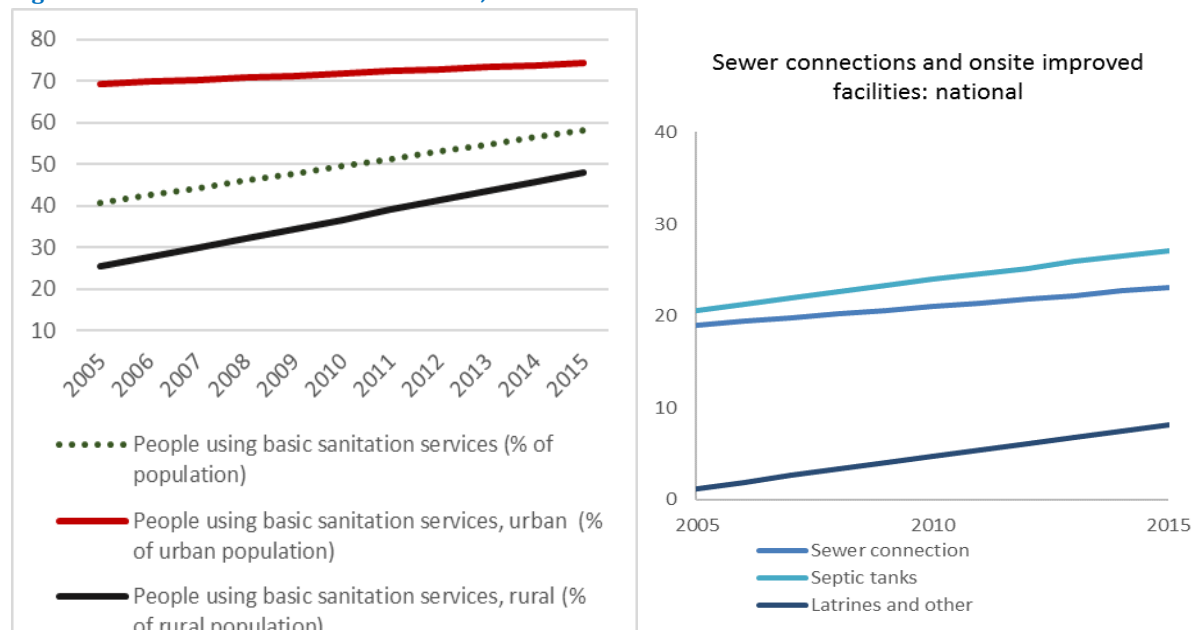


Source: MICS, Punjab and Sindh.



Moreover, the lagging outcomes of poorer households may reflect overall environmental factors that impact children’s health. For instance, there is a huge gap between urban and rural access to basic sanitation services (Figure 21). Despite significant improvement over the past decade, from a very low base of 25 percent in 2005, only three-quarters of urban households and less than half of rural households had access to basic sanitation in 2015. Similarly, sewer connections are relatively uncommon; the frequent transmission of diarrheal and other diseases may be attributed to inadequate sanitary services. Less than a quarter of households had septic tanks and sewer connections in 2015. Further, the share of households with latrines and other modern sanitation facilities was less than 10 percent.

Figure 21. Sanitation Conditions over Time, 2005–15



Source: washdata.org.

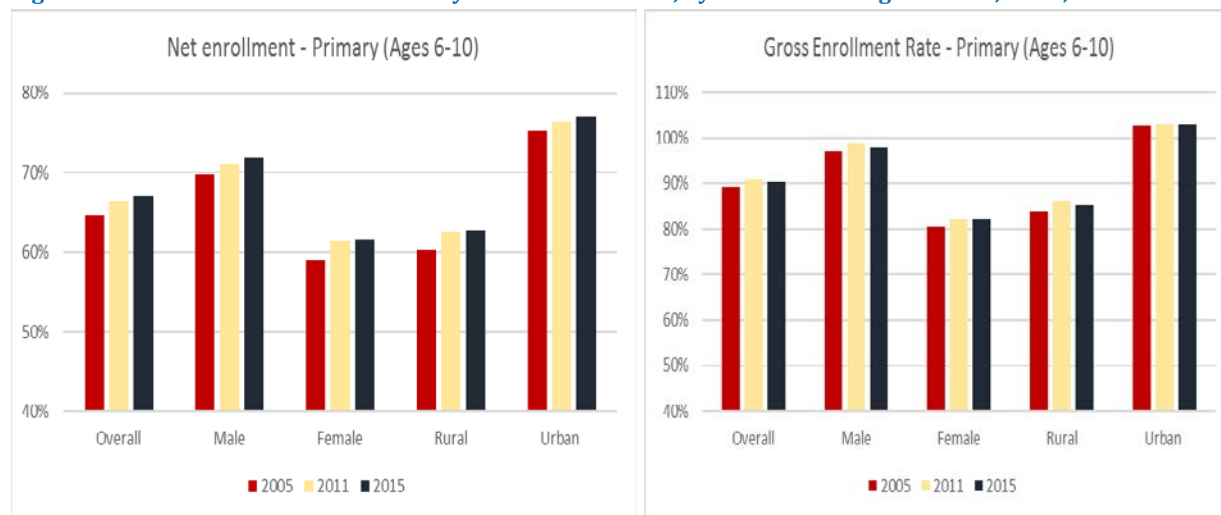
### 3.3 EDUCATION AND LEARNING FOR ALL

**Primary school enrollment rates are improving over time, but very slowly.** The gender and regional gaps remain significant. In 2010, Article 25A of the Constitution declared education as a fundamental right, following which laws were passed in each province that entitled all children aged 5 to 16 to free and compulsory high-quality education (ASER 2016). Despite that, progress has been slow—between 2006 and 2015, net primary enrollment rates increased by only 2.4 percentage points, from 64.6 to 67 percent, while gross primary enrollment rates stagnated at around 90 percent (Figure 22).<sup>11</sup> The overall enrollment rate masks gender and regional disparities. In 2015, the female gross enrollment rate at the primary level was 82.2 percent in contrast with the male gross

<sup>11</sup> The net enrollment rate includes children of the official age for that particular level. For example, for primary school, it is between 5 and 9. In contrast, gross enrollment rate includes students of all ages as long as they are enrolled at that particular level. Hence, it includes students who exceed the official age group, which could be because of late or early enrollment or repetition (World Development Indicators).

enrollment rate of 98 percent. Similarly, the gross enrollment rate in rural areas (83 percent) lags behind that in urban areas (103 percent). Girls in rural areas fare the worst.

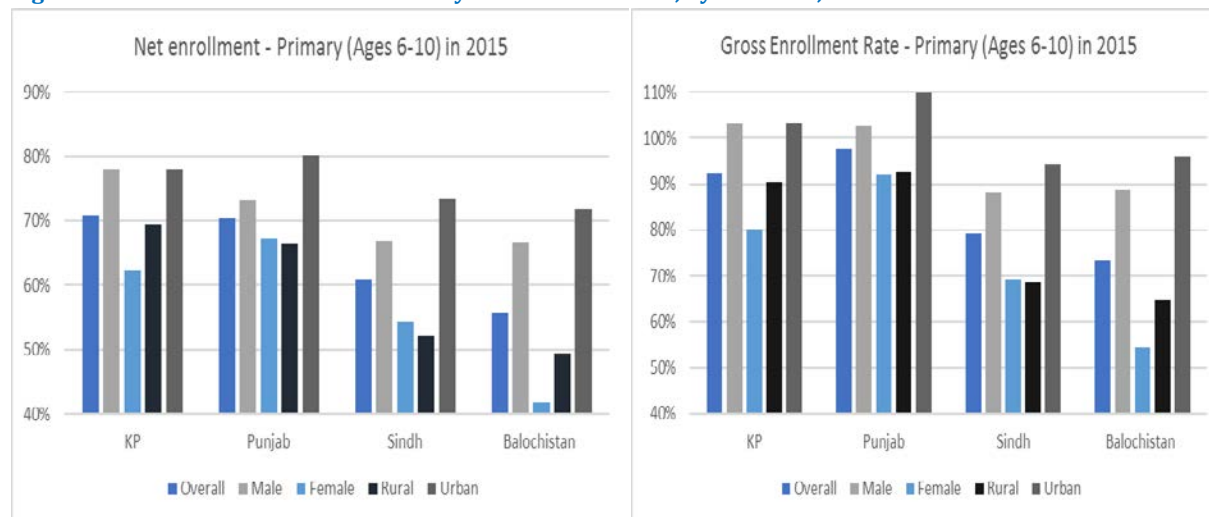
**Figure 22. Net and Gross Rates of Primary School Enrollment, by Gender and Region: 2005, 2011, 2015**



Source: PSLM 2005, 2011, 2015.

**Similar disparities exist across and within provinces (Figure 23).** With respect to net enrollment rates at the primary level, Khyber Pakhtunkhwa and Punjab (71 and 70 percent, respectively) fare better than Sindh and Balochistan (65 and 56 percent, respectively). Within provinces, enrollment rates vary greatly by location and gender. Khyber Pakhtunkhwa is doing better than other provinces in regional parity but in Sindh and Balochistan, the difference in net enrollment rates between urban and rural areas is more than 20 percentage points. The gender gap is largest in Balochistan, where the female net enrollment rate is 42 percent compared to the male net enrollment rate of 67 percent. Because of limited school infrastructure and sparse population distribution, in 2016, the Balochistan government removed gender segregation for all primary schools across the province in its effort to improve female enrollment rates. The effect of such policy efforts is yet to be assessed.

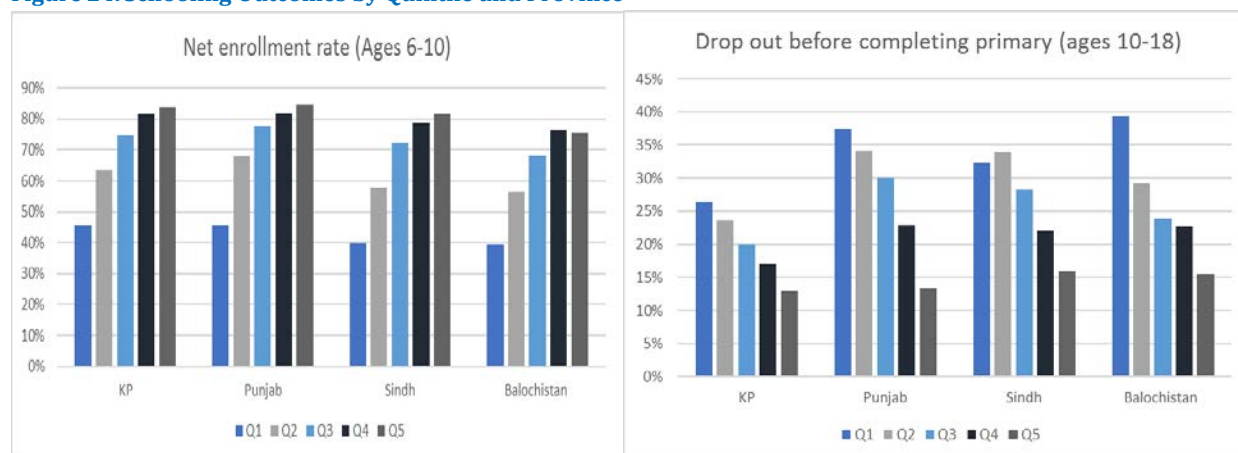
**Figure 23. Net and Gross Rates of Primary School Enrollment, by Province, in 2015**



Source: PSLM 2015.

**Household incomes have a strong association with children’s school enrollment rates, suggesting that a demand-side access issue is a significant determinant of education (Figure 24).** The net enrollment rates range between 39 to 46 percent in the lowest income quintile and between 75 and 85 percent in the highest quintile across the four provinces. While the outcomes of the non-poor in the top three quintiles (Q3–Q5) show little variation, the outcomes of the bottom two quintiles significantly lag behind. The severity of the gap between the poor and non-poor varies by province. With respect to dropout rates before the completion of primary schooling, the differences across income groups are much more pronounced in Punjab: 38 percent of children aged 10–18 and in the lowest income quintile dropped out, as compared to 13 percent of those in the highest income quintile.

**Figure 24. Schooling Outcomes by Quintile and Province**

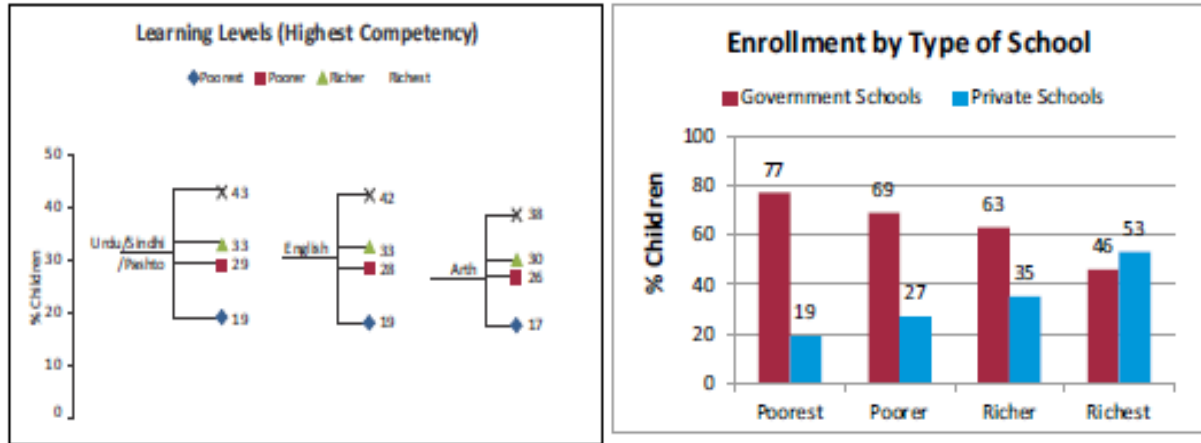


Source: PSLM 2015.

**The quality of educational outcomes is a source of concern in Pakistan.** The goal of universal primary schooling (part of the Millennium Development Goals), let alone good-quality learning, has not been met. According to ASER studies (ASER 2015a, 2015b), in urban areas only three-fifths of

grade 3 students could correctly perform a subtraction like 54 – 25 in 2015; in rural areas this share was limited to only two-fifths of the students. ASER (2016) shows similar findings: in rural areas, 48 percent of grade 5 students and 83 percent of grade 3 students could not read a grade 2 story in Urdu, Sindhi, or Pashto; 54 percent of grade 5 students and 85 percent of grade 3 students could not read grade 2 sentences in English; and 52 percent of grade 5 children could not do two-digit division. Such competency levels greatly vary by household income level (Figure 25, left). According to Andrabi et al. (2008), learning outcomes may also be influenced by whether a child attends public or private school. Children in private schools report higher test scores in all subjects (Figure 25, right). The quality difference is so large that it would take 1.5 to 2.5 years of additional schooling for students in public schools to catch up with their counterparts in private schools in grade 3. Learning gaps between good and bad schools are also prominent as well as those between rich and poor households. In tests of English language proficiency, the difference between a high-performing and a low-performing public school is 24 times the difference between children from poor and nonpoor backgrounds (Das, Pandey, and Zajonc 2006).

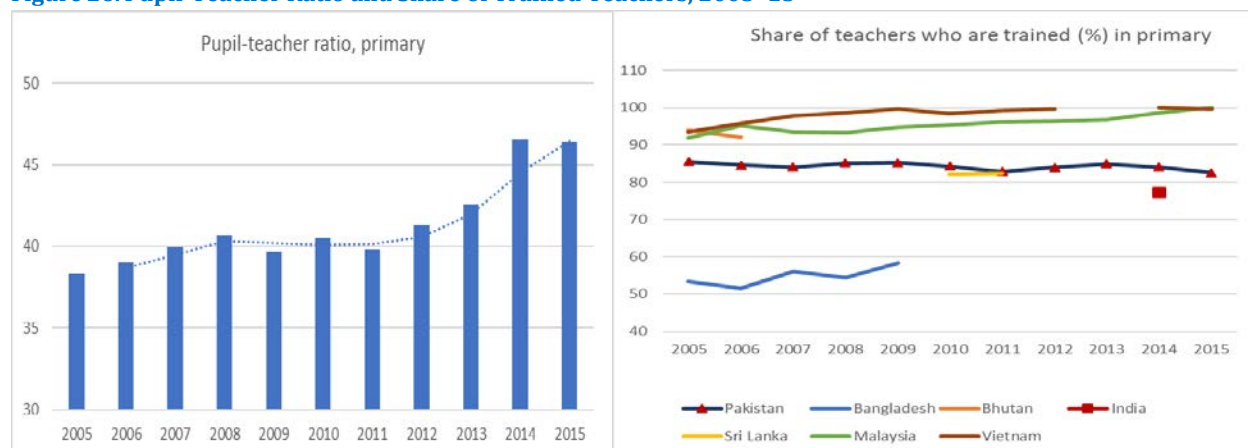
**Figure 25. Learning Outcomes, by Wealth Status, and Enrollment, by Type of School (government or private)**



Source: ASER 2016.

**The lack of progress observed in learning outcomes could also be because the supply of schools and teachers is not keeping pace with demand.** The pupil-to-teacher ratio has been consistently increasing, with a sharp hike between 2013 and 2014, when it increased from 42.5 to 46.5 (Figure 26, left). The share of trained teachers in primary schools (Figure 26, right) also suggests that Pakistan is lagging behind other countries such as Malaysia and Vietnam. Moreover, teachers' absenteeism and the quality of pedagogy are of concern: almost 22 percent of public school teachers were reported to be absent and many were seen to use ineffective teaching methods (Brown 2017).

**Figure 26. Pupil-Teacher Ratio and Share of Trained Teachers, 2005–15**



Source: World Development Indicators.

**The dire condition of school infrastructure likely constrains enrollment rates.** Government statistics for 2015–16 suggest that primary schools’ infrastructure lags that of higher-level schools. Only slightly more than half of Pakistan’s primary schools had electricity, about 67 percent have drinking water and toilets for students, and 71 percent have a boundary wall. Only in Punjab do almost all schools have drinking water, toilets, and boundary walls; primary schools in Balochistan fare the worst, followed by those in Sindh (NEMIS 2017).

**An estimated 22.6 million children do not attend school, 18 million of whom are between 10 and 16 years old (NEMIS 2017).** Balochistan is home to the highest proportion of out-of-school children, followed by the Federally Administered Tribal Areas (FATA). Nationwide, an estimated 30 percent of youth are also not in employment, education, or training, including a staggering 54 percent of women in 2014 (Bossavie et al. 2018).<sup>12</sup> Demand-side sociocultural barriers and bottlenecks influencing children’s exclusion from school are related to societal attitudes toward gender roles: girls may face restrictions on their mobility, while boys are pressured to start contributing to household incomes. Girls who marry early are likely to drop out of school. Demand-side economic barriers include the costs of schooling. These include not only direct costs such as expenditure on school materials, examination fees, and transportation but also the opportunity cost of a child’s time (UNICEF 2013). Child labor is common among children aged 10–14 years (box 2).

<sup>12</sup> Youth include those between the ages of 15 and 24 years who are unemployed and out of the education system.

## Box 2. Child Labor in Pakistan

### Statistics

Over 12.5 million children in Pakistan are estimated to be working, according to the Pakistan Child Rights Movement (CRM) national secretariat. The largest share is engaged in unpaid family work in the agriculture sector. More than three-fourths of children aged 10–14 years in employment are found in the agriculture sector (76 percent). Of children aged 10–14 in employment, 75 percent are in unpaid family work, while only 14 percent are in paid employment and almost 11 percent are self-employed. Similar patterns prevail for youth aged 15–17—the largest share of those in employment are, again, in agriculture and unpaid family work. Pakistani children who work are almost exclusively the poorest. The likelihood that children aged 10–14 living in the poorest households will participate in a learning activity is somewhere between 30 percent (for girls) and 55 percent (for boys). Even those who report engaging in a learning activity spend only 1 hour a day (for girls) or 3 hours (for boys). The gender differences are most pronounced for time spent on domestic work. Even though boys may report carrying out some form of domestic work, the average time spent on that activity remains negligible across age groups. Meanwhile, over 80 percent of the poorest girls aged 10–14 spend about 2.5 hours a day on domestic work. Almost all poor girls aged 15–19 report carrying out domestic work, as do over 50 percent of the wealthiest girls. The estimated time spent is over five hours for girls in the lowest income quintile and about one hour for the highest quintile.

### Legal Framework

The role of provincial governments has been increasing. In 2016, Punjab Province passed the Punjab Restriction on Employment of Children Act, which establishes 15 as the minimum age for employment and 18 as the minimum age for employment in hazardous work. The province also passed the Punjab Prohibition of Child Labor at Brick Kilns Act, which prohibits the employment of children under age 14 in brick kilns. Sindh passed laws prohibiting children under age 15 from working in factories and commercial establishments. Sindh also passed the Sindh Bonded Labor System (Abolition) Act. In 2017, Sindh Province passed the Sindh Prohibition of Employment of Children, which establishes 15 as the minimum age for employment and 19 as the minimum age for employment in hazardous work. Balochistan and Khyber Pakhtunkhwa tend to lag behind in these efforts. Federal and provincial laws, however, are not completely in compliance with international standards on child labor, including the worst forms of child labor. They tend to exclude informal work or bonded labor.

### Policy Efforts

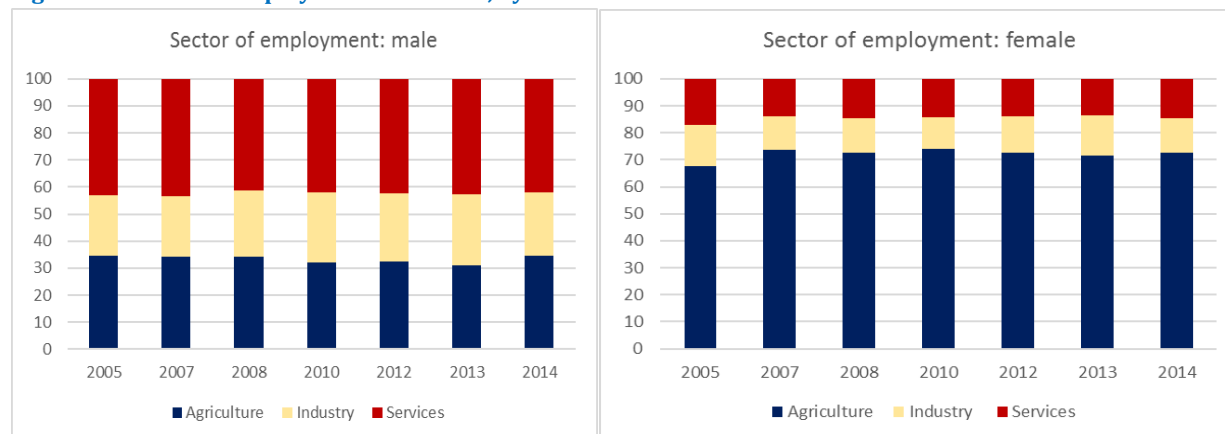
International evidence suggests that cash transfer programs (both unconditional and conditional) have shown to be effective in reducing child labor (Skoufias and Parker 2001; Bourguignonm Ferreira, and Leite 2003; de Janvry et al. 2004; Attanasio et al. 2010; Edmonds and Schady 2008). However, as Bhalotra and Heady (2003) suggest, children in land-rich households tend to work more and be less likely to attend school than children in land-poor households. If income is not the sole reason for child labor, then income support for households should be combined with other efforts to reduce it.

Recently, the Punjab government made a huge effort to reduce bonded child labor in brick kilns. They geographically mapped all brick kiln factories in Punjab, identified bonded child labor, introduced conditional cash transfers, and enhanced enforcement. The impacts of such efforts on the schooling outcomes and prevalence of child labor are yet to be further investigated, but such high-profile campaigns and policy changes are an encouraging development.

<sup>13</sup> See Bossavie et al. 2018 as part of Pakistan Jobs Diagnostic for detailed analysis of the trends and status of labor market outcomes and indicators. In this chapter, we highlight only key stylized facts about Pakistan's labor market.

<sup>14</sup> Based on International Labour Organization (ILO) estimates, which may differ from national estimates.

**Figure 28. Sector of Employment over Time, by Gender**

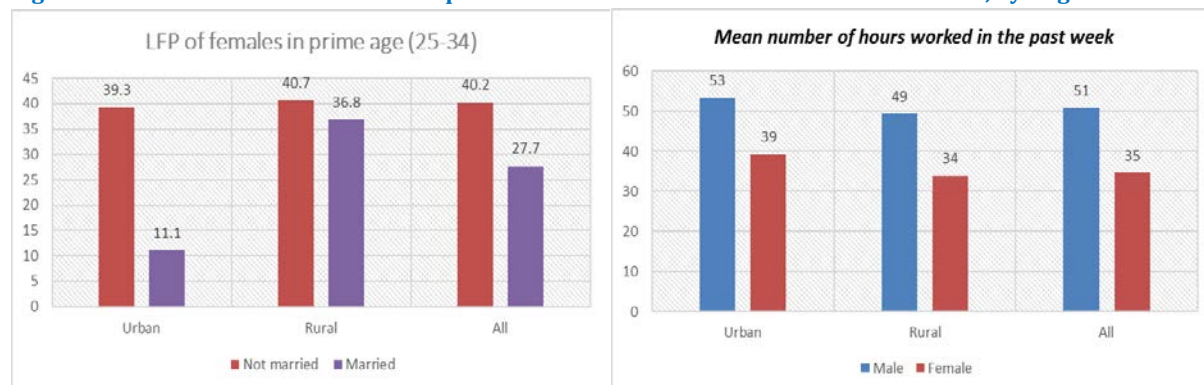


Source: LFS, various years.

**In a dynamic economy, as youth progressively attain a higher level of education than their older counterparts, they typically get an increasing share of wage, non-agricultural, employment.** For instance, in Bangladesh, the share of youth working in wage employment increased from a mere 13.2 percent to 33 percent between 2003 and 2016, while that of adults increased from 15.5 to 19.8 percent. Similarly, in 2013, the share of young and adult workers in the non-agriculture sector was almost the same, at 48.0 and 49.8 percent, respectively. By 2016, the share among young workers had significantly increased to 68 percent, whereas that of adults was 55.7 percent. In contrast, Pakistan’s youth do not appear to experience positive labor market transitions over time. Between 2005 and 2014, both youth and adults saw less than 2 percentage points’ increase in their share of wage employment (from 40.3 to 42.1 percent for youth; from 38.8 to 40.7 percent for adults). With respect to non-agricultural employment, progress is stagnant: youths’ share decreased from 59.0 to 58.0 percent, while that of adults increased slightly from 59.0 to 60.2 percent.

**With a low female LFP rate, human capital in Pakistan is severely underutilized.** As has been noted, low female LFP is associated with marital status, as women disproportionately bear the burden of household chores once married. Married women spend on average 46 hours per week on household work compared with 34 hours among unmarried women. The question is why the LFP rate of urban women is so much lower than that of their rural counterparts, whereas the burden of household chores and responsibilities related to marriage is similar (Figure 29, left). The availability of employment opportunities that offer shorter and probably flexible hours of work (Figure 29, right) in rural areas may be one explanation for the significantly higher LFP among women in rural areas.

**Figure 29. Women’s Labor Force Participation Rates and Mean Number of Hours Worked, by Region**



Source: Bossavie et al. 2018.

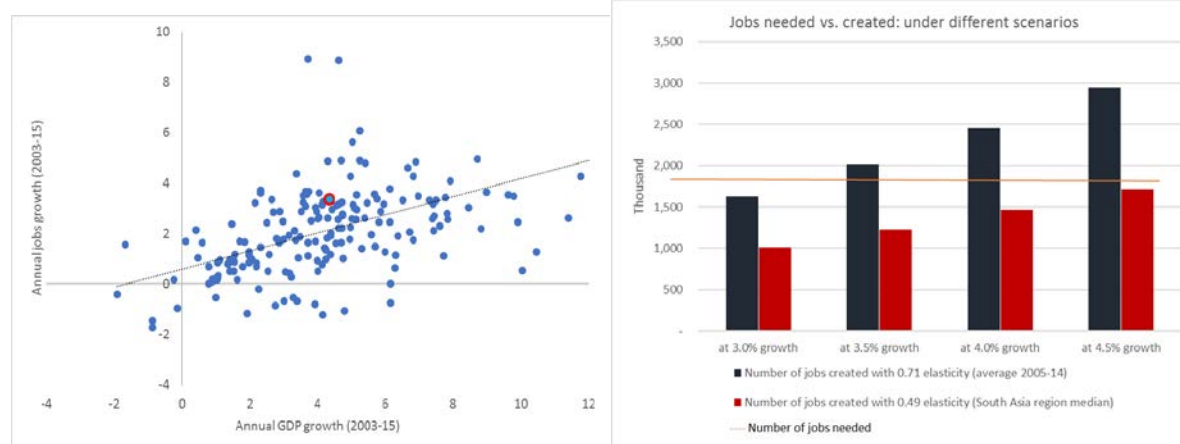
Note: LFP = labor force participation.

**While the pace of job creation in Pakistan has been at par with the labor force growth, a huge gap will develop unless the economy can create jobs and maintain growth.** Pakistan’s jobs elasticity to growth—at 0.71 (the average over the period 2005–14)—was substantially higher than that of Bangladesh (0.38), India (0.16), and even ahead of Vietnam (0.34).<sup>15</sup> Pakistan’s relatively high employment elasticity, as shown in Figure 30 (left), likely suggests that the problem is not so much job creation, as job quality. Nonetheless, over 2.1 million jobs might need to be created every year, given a large youth bulge and assuming increasing female LFP (to 45 percent by 2047). As Figure 30 (right) illustrates, if the economy can maintain its ability to create jobs (jobs elasticity to growth), Pakistan needs to achieve at least a 4 percent growth rate to absorb all the workforce in need of employment. However, if the economy responds to growth by adjusting working hours and the quality of jobs rather than merely increasing the number of the employed (elasticity level to 0.49–median value of the region), there will be a significant shortage of jobs.

<sup>15</sup> The elasticity for these countries was measured during the period of 2003–13. See Farole and Cho (2017).



**Figure 30. Jobs Elasticity and the Jobs Gap in 2047**



*Source:* World Development Indicators. *Note:* The number of jobs needed is calculated based on the projected size of the working-age population and the assumption that male labor force participation and overall unemployment rates remain at the level of 2014, while female labor force participation increases to 45 percent. GDP = gross domestic product.

**Given the type of labor market opportunities—mostly concentrated in agriculture or non-wage employment—and the lack of change to date, the value of education may not be fully appreciated in the labor market.** According to the National Skills Survey in 2014, the majority of working individuals report that reading, writing, and numeracy skills—all priorities of formal education—are not used for their work at all. The use of skills, of course, increases with the level of education, as those with higher education would work in occupations that require specific technical skills. A low level of skills utilization may reinforce the public perception that education is not a useful investment. The conundrum suggested here is that without enhancing the skills of the workforce, enhancing productivity would be difficult at best. At the same time, without a transition to a more knowledge- and skills-based labor market, human capital may not be adequately utilized and investment in it may seem wasteful.

**The existing stock of labor also exhibits a need to acquire skills and increase productivity.** The past and existing education systems have not endowed much of the current adult population with the skills required by the labor market. For a government that vows to pursue export-led growth to achieve a growth rate of over 8 percent between 2018 and 2025 (Government of Pakistan 2014/15), more investment is needed to improve the productivity of the existing labor force. Since labor force quality is critical to productivity, higher education and skills training will play a major role.

**Technical and vocational training extends to only a small proportion of the labor force** (Robalino and Cho 2012). There are approximately 3,581 public and private vocational and technical public and private institutes, with a larger share of private vocational institutes than technical ones (NAVTTTC 2017). Only 6 percent of young people have acquired technical skills through the Technical and Vocational Education and Training (TVET) system, and only 2.5 percent of youth have received on-the-job training (NAVTTTC 2017). Being in a TVET institution requires at least a secondary or higher secondary completion certificate, which is still limited to a small share of the population. According to the Ministry of Federal Education and Professional Training (2017), only 6.5 percent of Pakistanis have completed a higher secondary (12th grade) certificate.

**The tertiary education landscape is expanding in Pakistan.** Enrollment increased from less than 2.7 percent of the college-age population in 2002 to 10.4 percent in 2015. Gender disparities in higher education are small (53 percent male and 47 percent female). However, large income and regional disparities in access persist. According to PSLM data, only 0.4 percent of the poorest 20 percent participate in tertiary education as compared to 17.3 percent of the highest-income group. Similarly, the gross enrollment ratio (GER) in tertiary education is two times higher in urban than in rural areas, and enrollment figures are lowest among women from these groups. The critical role that good-quality higher education plays in economic growth cannot be emphasized enough. With a world moving toward the fourth industrial revolution, where higher-level thinking and problem-solving skills are in high demand, even as routine tasks are increasingly automated (box 2), Pakistan needs to invest heavily not only in building the right foundations for children in basic education, but also in strengthening the quality and relevance of the tertiary education system. Without improving the quality of the basic education system, the issues of inequality and labor market polarization will be exacerbated. In addition, an absence of the content and pedagogical training required to foster creative thinkers, innovators, and entrepreneurs at the tertiary level would result in Pakistan lagging behind comparable nations in benefiting from skill-biased technologies.

**For the stock of the labor force, those who are already working age but had been unable to go through the education system, limited options for skills development and upgrading exist.** The Skills Development Council, established in the 1980s, targets the uneducated population and offers training sessions of one month to a year that focus mainly, though not exclusively, on occupations in the manufacturing sector. The training targets identified skill gaps. The council was once reported as having a higher employment placement rate for trainees than any other training institute (Robalino and Cho 2012), although its current role after the country's devolution<sup>16</sup> in the complicated landscape of the TVET system is unclear. Recently, the government of Punjab introduced a Competency Based Training and Assessment that helps skilled workers get certified for their level of competence, as defined by occupational standards.

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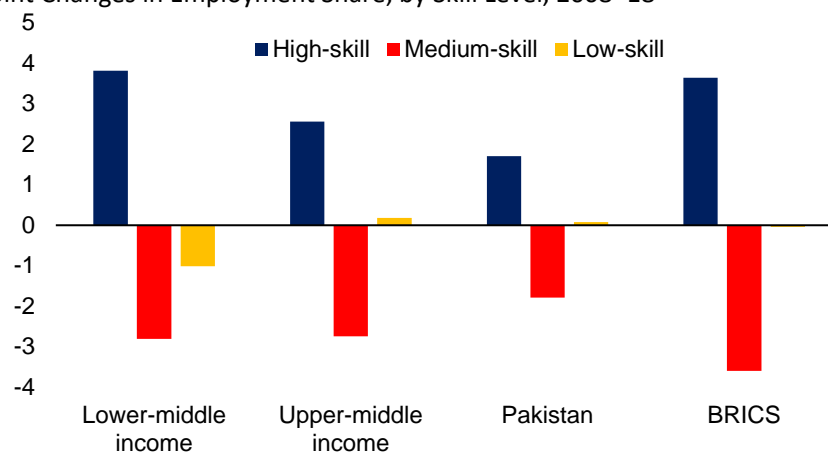
<sup>16</sup> Devolution refers to the transfer of the country's structural affairs from a centralized to a decentralized federation through the 18<sup>th</sup> amendment to the Constitution in 2010.

### Box 3. Emerging Technologies, Labor, and Inequality

Emerging technologies such as artificial intelligence, mobile robotics, smart factories, and predictive analytics, among others, are shifting production paradigms, in the same way that earlier technologies trigger industrial revolutions in the past. They are thus often linked to the concept of Industry 4.0—characterized by integrated cyber-physical systems in manufacturing—but could be just as prominent in services, and even in agriculture. These technologies can replace even cognitive and non-routine tasks, whereas earlier technologies could only replace workers doing tasks that were routine and that could be codified (Autor, Levy, and Murnane 2003).

It is possible that these technological advances are leading to labor market polarization, including in Pakistan. The tasks that are considered the most susceptible to automation even under current technologies are those that are done mostly by workers in the middle of the skill distribution (Acemoglu and Autor 2011). As a result, Acemoglu and Autor (2011) argue that medium-skill workers will increasingly do tasks previously done by lower-skill workers, leading to a growth of jobs at the top and bottom of the skills distribution. This has been observed in several industrial economies, and arguably even in low-income economies. In Pakistan, there has been a rapid increase in the share of high-skilled employment in the last decade, accompanied by the rapid shrinking of medium-skilled employment, and slight growth in low-skill employment—illustrative of labor market polarization (figure B3.1). For example, in Pakistan the automation of systems in the central bank made 3,000 (mostly low-skilled staff) of 12,000 employees redundant. The savings boosted the salaries of the remaining employees (World Bank 2016).

**Figure B3.1 Possible Labor Market Polarization around the World, including in Pakistan**  
Percentage Point Changes in Employment Share, by Skill Level, 2008–18



Source: Authors' estimates, based on data from ILOSTAT.

Note: Modeled estimates are from November 2017. BRICS = Brazil, Russia, India, China, and South Africa.

## Continued

**Beyond labor market polarization, the new technologies could have implications for inequality, when viewed as skill-biased technical change.** These emerging technologies could require workers with high levels of skill to monitor, maintain, and direct the capital (including, for example, robots). Their non-routine tasks would require effective judgement and creative thinking. As economies become more capital intensive and as technologies are adopted faster, there may be an increased demand for more educated workers even as the net demand for labor declines. In the classic case of the Tinbergen race between technology and education, as characterized in Acemoglu and Autor (2011), changes in the skill premia, that is, the wage differential between a skilled and unskilled worker, depend on differences in the paces of skill-biased technical change and the growth of the supply of skilled labor. If the pace of skill-based technical change exceeds the pace of skilled labor supply growth, then the skill premia will rise. In contrast, if the supply of skilled labor grows sufficiently faster than the pace of technical change, then the skill premia could decline (Ahmed et al. 2017). Pakistan thus faces the challenge of balancing the necessary improvements in education for a skilled labor force, while accounting for the potentially radical changes in economic structure that new technologies may bring for labor demand and for inequality.

*Sources:* Authors' compilations. Autor, Katz, and Kearney (2006); Goos and Manning (2007); and Goos, Manning, and Salomons (2009, 2010, 2014) provide evidence of job polarization for a number of advanced economies. According to World Bank (2016), this polarized job growth can also be seen in many developing countries, although Maloney and Molina (2016) suggest that there is no strong evidence for polarization in less-developed countries yet.

## CHAPTER 4. POLICY DISCUSSIONS

**Statistics and trends related to human capital formation in Pakistan paint a bleak picture for a country aspiring to achieve the status of an upper-middle-income country within the next decade.** Despite much progress, many human capital indicators are still weak, and outcomes stagnated or even declined in recent years. In particular, poor households bear the brunt of poor-quality basic services, as seen in ill-equipped educational institutions and health-care centers. Huge disparities across provinces, between urban and rural areas, and by gender, among others, have persisted. What policies and institutions might best facilitate the provision of basic services to the people?

**This chapter addresses this question by reviewing the evolution of various policies related to population planning, health and nutrition, education, and social protection over the years.** Given the multitude of policies and shifts in direction, this chapter focuses on specific “eras” when policies and interventions positively or negatively impacted service delivery systems. It also tries to identify the factors that might have led to visible impacts. Though these factors might be attributed to the four pillars outlined in chapters 2 and 3, many overlap categories. In discussing policies and institutions over time, we pay attention to cultural and social norms, and the influence of foreign policies that impacted the thinking of, and direction taken by, policy makers and the government.

### 4.1 INFORMED DECISIONS ON PARENTHOOD

**The decision to be a parent is not made in isolation, and is endogenous to myriad socioeconomic factors.** Given this intricate interdependence, policy responses that seek to influence and inform this decision must be commensurately sophisticated. For instance, measures to increase informed parenthood would not merely include services and information related to birth control, but also prepare youth for parenthood. Relevant knowledge, information, and practices on reproductive health, young women’s health, and child’s development through health, nutrition, and stimulation should be disseminated and learned through formal education, social campaigns and training, and health services.

**Because of a combination of culture and social norms, discussions on reproductive health tend to be taboo, and thus the topic is not adequately addressed in the formal education system in Pakistan.**<sup>17</sup> This leaves many youth unprepared for the challenges, responsibilities, and realities of adult life—in particular informed decision making on fertility, birth spacing, maternal health, parenthood, and healthy practices for child development, among others. For instance, in Pakistan, it is estimated that 45 percent of women of childbearing age receive less than 80 percent of the recommended daily allowance (RDA) of food, which reflects a lack of balanced nutrition. This leads to many women bearing low-birth-weight babies (40 percent) and contributes to the persistence of stunting among children under five years of age (Khattak 2013).

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<sup>17</sup> Some high-profile child abuse cases have recently forced the governments of various provinces to start introducing life skills in the teaching process. Sindh formally announced the inclusion of such a course in schools in January 2018. Punjab also expressed the intention in a public Human Development Forum in February 2018.

**Apart from formal education, social campaigns could be a source of information and knowledge.** Interestingly, Pakistan was one of the first countries in the world to initiate a national family and population planning program in the 1950s (Zaidi 2015). To date, relevant programs have mainly focused on married couples seeking reproductive health services. Depending on the period (era) of political leadership and sociopolitical influence, the form and prevalence of programs have varied, from a focus on the use of traditional midwives (*dais*) in 1965–73, to community-level couples’ training in the 1970s, to public media and campaigns in the late 1990s. Not all political administrations have supported family planning, however. For instance, in the late 1970s to mid-1980s, family planning programs were dismantled by religious hard-liners.

**A lack of concerted government efforts to support family planning since the ratification of the 18th Constitutional Amendment, which devolved many aspects of service delivery to the provinces, is quite evident.** Family planning and reproductive health services in Pakistan are provided by two government departments: health and population welfare. The private sector and nongovernmental organizations also play a role. Whatever the approach, the literature suggests that planned parenthood programs have been chronically underfunded (World Bank 1995). Between 1995/96 and 1997/98, when population-planning programs appear to have been the most visible and prevalent, expenditure on such programs was only about 0.15 percent of gross national product and since 2005–06 it has remained at or below 0.10 percent of GDP (Zaidi 2015).

## 4.2 STRONG START THROUGH EARLY CHILDHOOD DEVELOPMENT

**The prevalence of stunting has remained unchanged over the last 50 years, with Pakistan ranking third in the global burden of stunting.** In South Asia, Pakistan has the lowest rates of the early initiation of breastfeeding and exclusive breastfeeding, the highest rate of bottle feeding, as well as low rates of the timely initiation of complementary feeding, all of which contribute to chronic malnutrition.<sup>18</sup> It is estimated that the malnutrition crisis in Pakistan costs the economy 2–3 percent of GDP per year. Meanwhile, as has been noted here, investments made in the first 1,000 days of a child’s life are critical because this is when most of the damage to physical growth, brain development, and human capital formation occurs due to inadequate nutrition. Many early damages may be irreversible.

**Historically, Pakistan has lacked a comprehensive and concerted approach to combatting malnutrition and a lack of maternal health and support.** Malnutrition, as discussed above, is attributable to a number of factors including inadequate access to a balanced diet, poor care for women and children (e.g., related to nutrition, sanitation, etc.) and insufficient access to good-quality health care. The solutions thus require a multisectoral approach. Most interventions early in Pakistan’s history were small in scale and of limited scope, other than a few exceptions such as the mass introduction of iodized salt (for iodine deficiency) and vitamin A supplementation (World Bank 2014).

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<sup>18</sup> See Raju and Dsouza (2017) for a review of the sources of children’s undernutrition in Pakistan.

**Since devolution in the late 2000s, provinces have been developing their own nutrition plans.**

Recent analysis and planning at the provincial and national level have been guided by the global Scaling Up Nutrition framework, focused on scaling up “nutrition-specific interventions” through the health sector and “nutrition-sensitive interventions” through other sectors at all levels. Pakistan, in 2013, became the 34th country to join the framework. Currently, nutrition activities in the provinces are delivered mainly by NGOs contracted directly by the United Nations and/or donor nations. The government provides some services through clinics (e.g., treatment of acute malnutrition, provision of zinc and oral rehydration solution to treat diarrhea) and at the community level (through Lady Health Workers program).

#### Box 4. Role of the Benazir Income Support Program (BISP)

##### **Overview**

The Benazir Income Support Program, launched in June 2008, is the Government of Pakistan's flagship safety net program. BISP provides (unconditional) cash transfers to its nationwide beneficiaries. By directly transferring the benefits to the female heads of households, BISP aims to not only reduce poverty but also empower women. To date, more than \$3 billion has been allocated and disbursed to 5.4 million beneficiary households.

BISP's service delivery systems feature a strong citizen interface, eligibility determination processes, robust payment mechanisms, and an information system for case management. The systems have been further strengthened over time, and recognized as global best practices. For example, the National Socio-Economic Registry (NSER) stores data on more than 27 million households (approximately 167 million people) and has been instrumental in the processes of determining eligibility and objectively identifying the deserving poor. Strong collaboration with the National Database and Registration Authority (NADRA) in authenticating beneficiaries using the National Identity System, and with the banking sector to provide digital payments, also makes the delivery systems more robust.

##### **BISP's Impact on Female Empowerment**

By requiring that beneficiaries possess computerized national identity cards (CNICs) to receive benefit transfers, BISP has exponentially increased the number of women holding CNICs. The number of female CNIC holders has doubled since 2008, facilitating their access to financial services, inclusion in electoral roles and voting, as well as rights to services (Malik 2014). The share of women who report that they would never vote is 16 percent lower for BISP beneficiaries than nonbeneficiaries (BISP 2014). Also, more than 93 percent of the current BISP beneficiaries are being paid through efficient and transparent technology-based mechanisms (biometric verification, debit cards, mobile phones, smart cards), which offers the poorest women and their families access to banking accounts for the first time in their lives.

Quantitative and qualitative analyses suggest that women gain bargaining power by receiving BISP benefits; a significant share (64 percent) of female beneficiaries report having control over the funds. Women beneficiaries reported feeling that they were no longer completely dependent on their husbands, but were now supporting their husbands in running the household. The BISP has also contributed to changing community perceptions regarding the mobility of women. In line with global literature, benefits provided to women contribute to children's education, improved food intakes for the household, and better mobility in both urban and rural areas. It is also likely that empowering women and increasing their ability to make decisions also serve to foster their use of reproductive health services.

##### **BISP's Impact on Early Childhood Development**

According to several evaluations, BISP has had a positive impact on per adult equivalent monthly consumption, especially food consumption and diet quality (in particular involving high-quality protein). Associated with this, it is reported that BISP has significantly reduced children's malnutrition (measured by wasting).

*Source:* Authors' compilation based on Malik 2014; Hou 2011; Hou and Ma 2011.



## 4.3 EDUCATION AND LEARNING FOR ALL

**Successive governments have drafted and implemented numerous policies focused on education.** This stands in contrast to the relative silence on pillars 1 and 2. However, even as enrollment rates have consistently increased over time, the pace of improvement in educational quality has been slow. Moreover, standards of learning in the country, as measured by various education indicators, are not commensurate with the number and scope of interventions. The challenges—rote learning, outdated curriculums, poor governance, and an untrained or absent teaching cadre—have remained woefully the same since 1947. There is an urgent need recognized by recent governments to implement programs and policies that could prepare 70 million children, and counting, to face the challenges of a more globalized and competitive world (Ali and Hafeez 2017).

**The Ministry of Federal Education and Professional Training along with the provincial governments oversee the education system of Pakistan.** The first policy document in Pakistan developed after independence in 1947 proposed making education accessible to all by providing free and compulsory education within a decade. According to Article 25 A of the Constitution of Pakistan, the state is responsible for providing free and compulsory education to children aged 5 to 16 years. Curriculum development, accreditation, and the financing of research and development are assisted by the federal government, whereas the provision of education services is carried out by provincial governments. Over seven decades, numerous education commissions, reports, and policies have been produced at both the federal and provincial levels. Even so, the country fell short of achieving even the universal primary schooling outlined in the Millennium Development Goals (MDGs) for 2015.

**Pakistan's education policies have resulted from a combination of the various internal and external factors that eventually shape government plans.** External considerations include social, political, and economic trends at the global level, as well as common interests with advanced nations (Siddiqui 2016). Meanwhile, internal considerations include historical, political, religious, and ideological factors, alongside with, importantly, resource availability. From early on, for example, with the *National Education Policy of 1959*, the focus has been on inculcating national and religious values. Similarly, shaped by the secession of East Pakistan as a country and the war with India in 1971, the *Education Policy 1972* nationalized private educational institutes to give the government greater control, and encouraged the role of students and teachers in nation building.

**A turning point came with the *Education Policy 1979*.** There was an emphasis on Urdu as the language of instruction. External pressure and the foreign policy of the time resulted in the introduction of Arabic learning in the country. Pakistan studies and *Islamiyat* (i.e., Islamic religious studies) were made compulsory subjects from grade one till college. The Literacy and Mass Education Commission was established in 1981 to promote plans for both formal and non-formal mass education in the country. The concept of schools centered on mosques and *mohallahs* (neighborhoods) was introduced under this policy. Additionally, the policy allowed for the existence of private schools, which could operate with English as the medium of instruction. As a result, the divide between the haves and the have-nots deepened as higher-income households increasingly chose a private school education for their children. Subsequent education policies continued to

emphasize improved access to elementary education (up to grade 5) and by the turn of the century, elementary education was made compulsory and free. By the 1990s, the language of instruction had partially reverted back to English. At the same time, an increasing number of private schools were opening up with lower education fees.

**Since the early 2000s, the provinces have been pursuing innovative reforms in the education sector.** Each province had embarked on some form of transformation in the period, even though since 1998 there has been no clear education policy (the country came under military rule in 1999). Since the 18th Amendment devolved a large degree of administrative authority to the provinces in 2010, each province has been very active in the area of education policy development. Punjab and Khyber Pakhtunkhwa formed their own education policies and education targets, and have since been actively working to implement their policy agendas. Punjab has been aggressively implementing the “Schools Reform Roadmap,” (School Education Department, Government of the Punjab, 2011) parts of which had been introduced in the early 2000s. Both Punjab and Sindh have embarked on a public-private partnership approach to education delivery, where financing is given to private schools catering to poor and underserved populations. The reform initiative has contributed to an increase in enrollment; impact evaluations show evidence of both improved learning as well as access for poor segments of the population. The education sector reforms in Khyber Pakhtunkhwa are relatively new and began in 2013, focusing on training the primary school heads, offering on-site teacher training, and providing special incentives to female teachers (Elementary and Secondary Education Department Government of Khyber Pakhtunkhwa Pakistan, NA). The aim is to achieve data-driven reforms, including the development of a digital monitoring system (Naviwala 2016). In Sindh, a recent reform started the rationalization of schools in 2012, with the aim of promoting better management and improving school facilities. Other reforms have digitized the teacher payroll and eliminated the problem of ghost teachers. Since early 2003, efforts to provide free primary school textbooks to students have been closely monitored (Naviwala 2016). At a national scale, the country has experimented with the non-formal delivery of education, parent and community participation, stipends for girls to attend school, and teacher training in various ways.

**Critical issues that have persisted include outdated textbooks based on curriculums that promote rote learning and memorization.** Even now, when 21st century learning is about the development of creative thinkers and problem solvers, science and mathematics textbooks in Pakistan lack an emphasis on conceptual learning. Accordingly, however well trained the teachers may be, they tend to gravitate back to dictating notes and encouraging rote learning. It can also be argued that the teachers are resistant to change and are not willing to adopt advanced pedagogical techniques to promote a mindset of critical thinking among students.

**Decades of the reinforcement of memorization and a lack of emphasis on problem solving and critical thinking appears to have had an impact on the overall quality of education in tertiary-level institutions.** With the exception of a few universities, the teaching and learning being conducted in most colleges and universities in Pakistan has been of relatively low quality. Pakistani universities do not show up in major international rankings except for two in the Times Higher Education Ranking (in the 500–600 band) and six in the QS World University Ranking (500–700 band). Acute shortage of qualified faculty in universities, a weak system of quality assurance, limited

progress in the areas of private (external) degree programs (through the establishment of the Directorates of Distance Education in selected institutions) and outdated curricula that do not fit with the types of skills required by a growing and diversifying economy, have contributed to the poor performance of the tertiary education system in Pakistan. After decades of neglect, Pakistan's tertiary education sector has seen a revival with the establishment of the Higher Education Commission in 2002, which was granted more funding and autonomy as compared to the previous agency, the University Grants Commission. The Higher Education Commission introduced initiatives to improve quality and instill a culture of research. It closed low-quality programs and controlled the mushrooming of substandard higher-education institutions. Despite making considerable headway toward addressing the challenges facing the tertiary education system, much remains to be accomplished, especially amid the multi-layered governance of the sector.

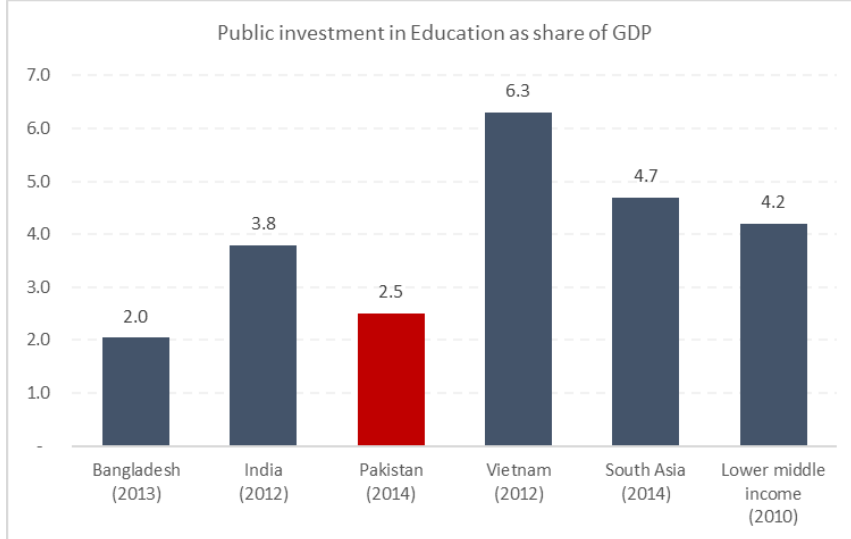
**The adequacy of the financing, in both level and quality, for education is of concern.** It is generally accepted that even though education has received a higher share of investment than do health and other sectors of human capital, the impact of interventions has not been clear. International development partners, both bilateral and multilateral, have supported the education sector throughout the history of Pakistan. The greatest support in the last couple of decades was that of the Social Action Program (SAP), backed by the World Bank and multiple donors. It was an intervention of over \$8 billion, of which \$450 million was from the World Bank (Altaf 2011). SAP was unable to yield positive results. The World Bank (2005) provided a candid review and analysis of why the program failed. The key issues identified include a lack of proper planning and analysis,<sup>19</sup> and a lack of understanding of Pakistan's social and political context, at a very turbulent time when a democracy was being re-installed after almost a decade of dictatorship. In addition, the pressures to inject high volumes of financing from a range of donor sources did not sufficiently consider the absorptive capacity of the economy and system. SAP illustrates the challenges faced by social sector interventions even when support and funds have been provided.

**In recent years, the budgetary allocation to education in Pakistan is about 2.5 percent of total GDP, which is less than many of comparator countries (Figure 31).** In 2008–09, public expenditures as a percentage of GDP reached a peak of 2.8 percent but dropped to 2.2 percent in 2010. In 2015 education amounted to 2.6 percent of GDP. Some may argue that the quality, more than the level, of spending is more important given that other countries such as Sri Lanka or Bangladesh have fared better than Pakistan in education with their education budget at 2.1 and 1.9 percent of GDP, respectively. However, given the demographic structure with a large share and number of school aged children in Pakistan, to maintain per pupil school expenditure likely require increases in education financing.

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<sup>19</sup> Also cited as an issue in Altaf (2011).

**Figure 31. Public Investment in Education as Share of GDP, Various Countries**



Source: World Development Indicators.

**Lack of monitoring and motivation have also been an issue.** Reports from civil society organizations such as the Society for the Advancement of Education (*SAHE*) and *Alif Ailaan* suggest that teachers may be treated like political workers by ruling parties. For instance, anecdotal evidence suggests that teachers are usually assigned to do party tasks such as being in polling stations during election days, and that teacher unions often have close ties with political parties for patronage. Health providers, though not enlisted for electoral duty and support, do have the local ruling parties' patronage as these positions are handed down for political loyalties (Callen et al. 2016).

## Box 5. BISP's Waseela-e-Taleem (WeT) Program

### Overview

The Waseela-e-Taleem (WeT) program is BISP's co-responsibility cash transfers (CCT), which provides additional financial support to BISP beneficiary families for their children's primary education. Conditions include enrollment and over 70 percent of attendance. The program was launched in five pilot districts in 2012, expanded to 27 districts in 2015, and is implemented currently in 32 districts across all provinces with plans to expand into 18 additional districts. To date, 1.9 million children in BISP beneficiary families, aged 4–12 years old, have been enrolled into the WeT program.

WeT's service delivery process builds on six components, including supply capacity assessment; social mobilization; registration; admissions and attendance verification; case management; and cash transfers. Given that demand-side interventions such as CCTs would not help if supply-side services are not in place, the BISP conducted a supply-side capacity assessment to ensure the provision of primary schooling services prior to the launch and expansion of the WeT. The program also carefully defines conditionality and compliance conditions so enrollment and attendance are regularly assessed for benefits payment.

### WeT's Impact on Primary Education

According to an Oxford Policy Management evaluation in 2016, WeT increased BISP children's primary school enrollment by 10 percentage points from the average 70 percent base. The impact is slightly higher for girls than boys as girls' base enrollment rate level was lower. The program also boasts a retention rate (the share of those attending the schools among those admitted) of 98 percent, and 91 percent compliance with over 70 percent attendance. The program impact is greater for children from poorer households with fewer siblings.

### Global Evidence on CCTs

Over the past decade, CCTs have become popular as an alternative, or a complement, to unconditional cash transfers. Both are targeted at poor families. While unconditional transfers simply aim to reduce the current level of poverty in a household by transferring resources, CCTs have an additional objective of influencing future levels of poverty by requiring beneficiaries to make behavioral changes for investments in the human capital of members of the household, usually focusing on children's health, nutrition, and education. With their emphasis on building for the future, CCTs have spread rapidly in the developing world and, overall, have been shown to have positive impacts (Fiszbein and Schady 2009). Primary school CCTs, on average, have contributed to increasing enrollment rate by 6 percentage points according to a meta study conducted by Overseas Development Institute (ODI 2016).

The transfer element has increased the consumption levels and stabilized the income flows of participating households; while the conditionality element has led to significant improvements in school enrollment and attendance, especially in countries where those figures were low to start with. Recently, the role of conditionality is being questioned. A few studies suggest that unconditional cash transfers show equivalently positive or better impacts (Garcia and Saavedra. 2017), and conditionality requires significant administrative capacity, including collaboration across sectors, to be able to provide effective services while monitoring compliance. The BISP's WeT evaluation appears to suggest that conditionality combined with resource transfers has played an important role in improving educational outcomes in Pakistan.

*Source:* Authors' compilation from OPM (2016).

## 4.4 LABOR PRODUCTIVITY

**Policies to promote labor market productivity may encompass a range of interventions.** This analysis excludes policies related to trade, industry, or taxation to enhance overall jobs opportunities, and instead focuses exclusively on labor regulations that may affect the returns to human capital in the labor market and the development of productive human capital. Interventions to develop human capital within this category mostly include active labor market programs such as training, job matching, or support programs targeting youth, female and marginalized populations, and social protection and benefits for productive activities.

**Pakistan has ratified 27 conventions on labor.** These address the worst forms of labor including child labor, bonded labor, and forced labor, and include minimum wages, among many other topics. Nonetheless, actual implementation on the ground remains a question. International pressure has helped implementation, due to a fear of losing potential exports. This was the case, for example, regarding child labor in the hand-knotted carpet industry. Other conventions remain more loosely followed (Pasha 2017). A large share of employment in Pakistan is in the informal sector. Many people are self-employed or work in household or family enterprises, often as unpaid workers.

**A number of programs have sought to ease the entry of youth into the labor market, and disadvantaged youth in particular, and to help improve labor productivity.** Various governments have provided direct support, such as through microcredit or cash transfers, to encourage long-term investment in human development. In the early 1990s, a yellow cab scheme was introduced; the government imported a large number of cars to be given to poor unemployed youth on a subsidized installment basis. (There has not been a clear evaluation of the scheme, which ended with a change in government.) More recently, since 2008, the Benazir Bhutto Shaheed Youth Development Program introduced skills development for youth in Sindh between ages 18 and 35 years with at least a secondary education. The scheme provides stipends to trainees enrolling in selected private and public institutions. The current government has also introduced some schemes including micro, interest-free loans for young entrepreneurs, discounted-interest-rate loans for youth, youth training schemes with stipends, and skills development schemes for jobless youth. The efficacy and effectiveness of these schemes are yet to be evaluated.

## CHAPTER 5. CONCLUSION

**This paper outlines trends and the current status of human capital development in Pakistan.** Specifically, it reviews key policies and interventions that aim to improve the provision, access, and quality of basic services supporting human capital accumulation. In doing so, it considers the stages of the life cycle, and emphasizes the importance of investing starting from the early years.

**A critical question remains: why have the significant interventions and investments realized to date not resulted in improved indicators of human capital?** Part of the problem appears to be a consistently high population growth rate, which has inadvertently muted the impact of any reform. In addition, security issues and instability have hampered progress. Lopez-Calix et al. (2013) notes that Pakistan's record of general structural reforms has been characterized by fragmentation, incomplete reforms, and policy reversals. In its 70 plus years of independence, the country has oscillated regularly between military dictatorship and democracy. Each governing body has come up with its own ideas and policies about development, with support from the dominant development partners of that era, and blamed previous governments for any shortfall in attaining targets. Only in the last decade have two elected governments completed their terms—albeit amid constant turbulence. Our review suggests that this instability has affected reforms touching on human capital.

**The dominance of an elite class and ethnic fragmentation are two other factors affecting outcomes.** Easterly (2001) utilizes political economy and economic growth theories to explain the lack of improvement in social indicators in Pakistan. He considers the effects of a dominating elite class (that is, large landowners) who have little incentive to tax themselves to pay for the education of the masses. He also explores the link between ethnic fractionalization and poor public service and institutional outcomes. World Bank (2018a) considers how political economy factors can result in the misalignment of education systems—an argument that could easily be extended to public health and social protection systems.

**Another important element is the lack of awareness at the grassroots level, not only of the individual actions that might further socially desirable outcomes, but also of citizens' entitlement to good-quality services.** Huge disparities across income groups and the gender divide highlight the typical market failure of credit constraints, as well as a lack of positive externality associated with human capital investment in the society. Government attempts to address such market failures are weakened by misaligned incentives and ever-changing approaches toward human development. In particular, since the devolution of increased responsibility to provinces, and amid the currently unclear rules and roles associated with different levels of government, poor management is rampant. Citizens' expectations and demand for service delivery from the government seem to be weak, and governments are not being held accountable for even basic services.

**Finally, and in our view, most importantly, a life-cycle approach to human capital development seems to be missing from policy debates.** Considering the four pillars of human capital, we clearly see that issues touching on human capital are to a large extent endogenous, and

decisions are intertwined, as should be the resulting policies. But in our review of Pakistani policies we observe silos in policy development and implementation. The government structure, as in the majority of the world, is divided into ministries, or departments, each responsible for its own jurisdiction, whether education, health, labor, or social welfare. An integrated approach has not yet been a priority. A National Commission for Human Development, which offers national-level policy support to improving literacy and basic health services, does not seem to have much influence in utilizing an integrated human capital approach.

## LOOKING FORWARD: WHAT PAKISTAN CAN DO DIFFERENTLY IN THE NEXT 30 YEARS

### *Ensure More and Better Public Financing for Human Capital*

**Two primary reasons for the country’s dismal state of human capital may be the ‘commitment gap’ and the ‘implementation gap’ as identified in the 2009 National Education Policy (Ministry of Education, 2009).** The commitment gap is reflected in the low resource allocation to the sector. The problem is compounded when a significant proportion of the funds are allocated to a tiny proportion of well-maintained higher education institutions (Momon 2007). As a result, higher income groups end up being the main recipients benefiting from the public subsidy of education. The primary and secondary tiers of education, which are fundamental to developing human capacity, have been paid little attention. The implementation gap is generally affected by the governance of the sector. Constant political interference in educational institutions, results in reduced institutional autonomy and independent decision-making. An inefficient managerial capacity and lack of dedication/motivation of low salaried teachers, likely reduce the quality of offered services.

**Pakistan would need to address the ‘commitment gap’ by increasing the public financing of service delivery in education, health, and social protection.** Pakistan’s public expenditure on education, health, and social assistance are equal to 2.7, 2.7, and 0.6 percent of GDP, respectively.<sup>20</sup> These figures are noticeably below both global averages and the expenditures of comparator countries. In the area of education spending, the global average public expenditure on education is 6.7 percent of GDP, and similar economies like Indonesia, India, Malaysia, and Turkey spend between three to four percent of GDP on education. For public expenditure on health, the global average spending is 4.5 percent of GDP, with economies such as Indonesia and Malaysia spending about 4–5 percent of GDP. Comparable economies also tend to spend more as a share of GDP on social assistance programs than Pakistan, despite the size and reach of BISP. For example, Bangladesh, Indonesia, and Sri Lanka spend 0.7 to 0.8 percent of GDP on social assistance, while India and Turkey spend 1.1 to 1.5 percent.

**Merely increasing government spending on social sectors will not be enough; the governance of service delivery must be improved to address the implementation gap.** Several cross-country

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<sup>20</sup> Public expenditure data in this section are from the World Development Indicators 2018 and from the ASPIRE database. Pakistan’s education and health expenditure data are from 2015, and social assistance data are from 2013—the latest years for which internationally comparable data has been recorded in the databases.



studies find that the relationship between public spending and education or health outcomes is unclear (e.g., Harbinson and Hanushek 1992; Wolf 2004). Rajkumar and Swaroop (2008) estimate the impact of increased public spending on specific education and health indicators, and found that the magnitude of the impact, if any, depends on the quality of governance and institutions. They find that a 1 percentage point increase in the GDP share of public health spending lowers the under-5 mortality rate by 0.32 percent in countries with good governance, 0.20 percent in countries with average governance, and has no impact in countries with weak governance. Similarly, they find that a 1 percent increase in the GDP share of public education spending lowers the primary education failure rate by 0.70 percent in countries with good governance, but has no impact in countries with weaker governance. In Pakistan, a mere 20-30 percent of allocated funds are utilized in their designated manner due to weaknesses in administrative capacity and accountability mechanisms.<sup>21</sup>

**Deliberate effort must be undertaken to ensure the current financing for human capital investment yields meaningful outcomes including quality of learning, adequate protection from health risks, and equitable access to services.** To this end, a better balance of spending between administrative and development expenditures within the sector is required. Currently, in the education sector, for instance, over 90 percent of funds are utilized on recurrent heads, such as salaries, with the remaining going towards the entire development budget for improving quality such as teachers' training, curriculum development, and monitoring and supervision of education. Allocations should be disaggregated, funds released in a timely manner, and spending tracked on a regular basis. Moreover, this information should be made publicly available. Several provincial initiatives are worth examining and scaling-up to the national level. For instance, the Independent Monitoring Unit (in Khyber Pakhtunkhwa) and Programme Monitoring and Implementation Unit (in Punjab) have been created to collect data on a monthly basis and to gather information on teacher and student attendance, retention rates, infrastructure, and management (Read and Atinc, 2017). In addition, in order to increase the transparency and meritocracy of the teacher hiring process, Khyber Pakhtunkhwa mandates all teachers to undertake a test from the National Testing Services. It may take a significant amount of time for these innovations to show impacts, but continued efforts must be made to improve the governance for social service delivery.

#### *Introduce Interventions Targeting the Poor and Vulnerable, with an Emphasis on Women*

**Pakistan's bleak human capital indicators are largely attributed to poor outcomes among low-income households, many of whom reside in lagging regions and localities.** While overall poverty has come down, vulnerability to poverty and large disparities in access to basic services persist. Government capability to deliver services varies widely across regions, and so do the availability and quality of services. The poor, who face challenges in meeting their immediate needs with limited resources, are often unable to sufficiently utilize services due to various barriers. Security issues and conflicts in parts of the country pose additional constraints. A more robust system for delivering the services that will further human capital, focusing on equity, is required to reach needy households.

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<sup>21</sup> Ministry of Federal Education and Professional Training 2017 and Ministry of Education 2009.

**Targeted interventions focusing on low-income populations and female empowerment through provincial safety net programs are required.** BISP's approach to supporting the poor by focusing on female household heads—and its robust impact on various dimensions, including female empowerment and education—is a good example of the fact that targeted interventions can bring results. While the federal program provides basic support, in the context of decentralization, much needs to be done to complement federal-level efforts at the provincial level to empower women, reduce poverty, and boost resilience and opportunities for poor and vulnerable populations.

**Investment in girls' human capital cannot be overemphasized.** In Pakistan, too many girls drop out of school prematurely, before they complete their secondary education. A recent World Bank study (Wodon et al. 2018) suggests that limited educational opportunities for girls and barriers to completing 12 years of education cost countries between \$15 and \$30 trillion dollars in lost lifetime productivity and earnings globally. The potential costs of depriving girls of education are associated with: (i) reduced earnings and standards of living, (ii) child marriage and early childbearing, (iii) high fertility rates and population growth, (iv) less-informed decisions on health, nutrition, and well-being, (v) reduced agency and decision making, and (vi) weak social capital and institutions. Many such costs are borne by both boys and girls. But not educating girls is especially costly because of the relationships between education, child marriage, and early childbearing, and the risks that they entail for young mothers and their children.

#### *Take a Holistic Approach to Human Capital Investment, Focusing on the First 1,000 Days*

**When implementing initiatives to foster the human capital of the poor and vulnerable, the continuum of human needs, especially during the first 1,000 days of the life cycle, should be noted.** In Pakistan, basic health units and health workers provide ante- and post-natal care, as well as early child care through Basic Health Units (BHUs), though services are not easily accessible in all areas. Also, BISP and select cash transfer programs exist to support the poor. The critical priority going forward would be to augment these with complementary support focused on human capital. World Bank (2018a) suggests integrated programs that start from a Step 1 family support package—parental support, including planning for family size, maternal education about health and nutrition, and child's early nutrition and stimulation as well as health, nutrition, and sanitation—with a focus on vulnerable families. Step 2 involves pre- and ante-natal care and information on nutrition. Step 3, or the birth package, includes the provision of skilled birth attendants, birth registration, and the encouragement of exclusive breastfeeding. Step 4 focuses on children's health and development, with immunizations, information on deworming, identification and treatment of acute malnutrition, and other relevant information. The final step is the introduction of good-quality pre-school and early childhood development programs.

**In the Pakistani context, one would recommend adding an additional step—information sharing, starting at the school level, about health and hygiene, nutrition, and diet.** These topics need to be introduced at every level of education, in an appropriate manner that avoids taboo topics and navigates local norms. The introduction of respectful gender-based interactions in such education modules would be integral to improving women's empowerment and agency in decision making and labor force participation. In addition, media infomercials might be developed and introduced.

### *Provide a Suite of Second-Chance Programs for the Current Labor Force*

**While programs focusing on the first 1,000 days are critical for the future workforce, skills development and upgrading opportunities for the existing stock of the labor force are also important.** Support of basic education is critical to develop the foundational skills of the new generation of children. However, even if the quality of the education system improves today, and there is universal enrollment, these individuals will enter the labor force in at least 15–20 years. Pakistan’s economy cannot wait that long. Policy makers need to focus on giving a second chance to today’s workers so that they can gain and upgrade skills, and have the ability to improve their human capital resources.

**A suite of second-chance interventions that focus on developing the skills of individuals of different needs and abilities could be considered.** For instance, for the illiterate population, adult literacy and numeracy programs could encompass elements of financial literacy and socioemotional skills, that could help individuals get and retain a job, or start a microenterprise. These programs could be targeted and customized to the specific needs of vulnerable groups, such as rural women from disadvantaged groups. For the less educated population, options include packages of accelerated learning with opportunities to complete critical milestones in the education system and to receive certificates. For low-skilled workers, options for upgrading skills at a low cost with a strong linkage to labor market opportunities are required. Given the rapid technological changes at hand, second-chance programs could incorporate digital and information and communication technology literacy to capture the global outsourcing markets such as telemarketing or medical transcription. Some of these interventions are already in place (for instance, through the Skills Development Council, mentioned earlier), and others have been introduced repeatedly with different names (such as basic literacy campaigns) and still have shown little success. Future success would be bolstered by a clear government mandate to be implemented by the provinces. The federal government can play a strong stewardship role by incentivizing improved delivery through additional funds.

**In addition to skills development, policies should address labor market imperfections and challenges.** Mismatches between the demand and supply of skills, and limited opportunities for skills development are not the only challenges in the labor market. Indeed, many individuals equipped with skills have difficulty in finding suitable employment opportunities due to labor market imperfections and constraints. For instance, female youth with secondary education in urban areas are significantly constrained in participating in the labor market due to various factors including mobility constraints, lack of social networks to facilitate employment, and lack of information, among others. Interventions that link workers to jobs through information and intermediation services promise to improve employment outcomes.

### *Tertiary Education and Excellence*

**Pakistan needs to invest heavily in improved standards of teaching and learning at all levels of education, in particular at the tertiary level, if it is to leapfrog into the era of the fourth industrial revolution.** Strengthening support in the early years of life, as discussed above, will prepare a flow of productive youth. The tertiary education system, too, needs to be strengthened in

order to prepare a globally competitive workforce. Given the critical trade-offs between investments in a constrained fiscal space, investment in tertiary education can be better targeted and focused.

**High-growth sectors need to be prioritized in tertiary education.** Accordingly, investments need to be made in establishing centers of excellence for research and applied sciences to support the priority sectors. Related efforts would include the development of highly qualified faculty, twinning arrangements with world-class international universities, and university-industry linkages. Within the same priority sectors, mid-level skills would need to be addressed. That is, high-level research and development should be complemented by the simultaneous development of technical and vocational courses to prepare a full spectrum of relevant workers—an effort best accomplished in coordination and in tandem with the second-chance opportunities mentioned above.

**Finally, private sector investment in tertiary education can, and has, played an important role in the education landscape in Pakistan, and equitable access to institutes can be ensured by introducing and strengthening student loan schemes.** Among the few internationally comparable institutions of higher learning in Pakistan, private institutions feature among the top. Supporting the development of high-quality higher education institutes through proper regulation and regular monitoring is critical, and also needed to curb the low-quality institutions that have mushroomed across the country to cater to the increasing demand for tertiary education. In addition, it is important to ensure that students from lower-income quintiles have equitable access to institutes of higher education. This can be done by operating a well-designed student loan scheme that targets students from lower-income quintiles, and offers easy repayment terms.

#### *Empower Citizens to Ask for Improved Governance of Service Delivery*

**Citizen voice and agency is critical to bring any meaningful change in the population at large.** Pakistan has lacked the informed voice of citizens at the grassroot levels, a fact that has impeded the implementation of well-meaning reforms. Elite dominance (Easterly 2001) appears to be a reality affecting social sectors. The World Development Report 2004, *Making Services Work for Poor People* (World Bank 2003), provides a framework that could be implemented in Pakistan in the current context, and would be integral to any meaningful change that might improve human capital development over the next 30 years. Mechanisms to strengthen the voice of citizens to hold the state, politicians, and policy makers accountable for the delivery of basic services include: strong compacts with clear roles and responsibilities against which service providers are held accountable; effective management of service providers, including standards and monitoring of the quality the services delivered; and client power, or the possibility of choosing from among several service providers.

**Empowering citizens would require massive information campaigns using various forms of media, including short message services (SMS) to phones to raise awareness about citizens' rights and state responsibilities.** Organizations including the Annual Status of Education Report (ASER) under Idara-i-Taleem o Agahee, and Alif Ailaan, are active in monitoring student learning and various district performances. Such efforts need to be deepened and information shared widely across the population, both urban and rural. This can be done through the activities of NGOs, civil society organizations, and corporate social responsibility efforts. The information campaigns could, for example, feature what a well-functioning school should look like, or what services can be expected

at a health clinic, such that citizens have a benchmark against which to assess the quality of service delivery.

**Providing a platform for citizens' feedback on the provision of basic services—and mechanisms to reflect that feedback—is also important.** With the large penetration of mobile phones, feedback can be provided through easy-to-navigate web-based applications for smart phones and by SMS responses for regular phones. Such campaigns alone may not be able to eliminate the political economy of vested interests completely, but even so have proven effective in improving service delivery for the poor (World Bank 2018a). As services are increasingly delivered by the private sector (e.g., in private schools), citizen feedback and accountability mechanisms will become all the more important.

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## APPENDIX A: DATA SOURCES IN WORLD DEVELOPMENT INDICATORS (WDI)

	Main Data Source(s)	Years Covered in the Analysis	Source
<b>Macro trends</b>	World Development Indicators (WDI)	1970–2015	World Bank
	United Nations World Population Prospects (UN WPP)	1970–2015	United Nations
	Water, Sanitation, and Hygiene (WASH)	2005–15	World Health Organization and UNICEF
<b>Micro data</b>	Labor Force Survey (LFS), International Income Distribution Data (I2D2)	2005, 2007, 2008, 2010, 2012, 2013, 2014	Pakistan Bureau of Statistics, World Bank
	Pakistan Social and Living Standard Measurement (PSLM)	2005, 2011, 2015	Pakistan Bureau of Statistics
	Multiple Indicator Cluster Survey (MICS) - Punjab	2014	Punjab Bureau of Statistics
	Multiple Indicator Cluster Survey (MICS) - Sindh	2014	Sindh Bureau of Statistics

## APPENDIX B. SUMMARY OF SIMULATION MODELING FRAMEWORK

The simulation modeling framework used is the LINKAGE recursive dynamic computable general equilibrium (CGE) model of van der Mensbrugghe (2011), and has been used for analyses of demographic change and growth in Ahmed et al. (2016b), Ahmed and Cruz (2016), and World Bank (2015). LINKAGE is supported by a globally consistent data on production, consumption, investment, and trade from the Global Trade Analysis Project (GTAP) Database Version 8. This is a global database covering 140 economies. Pakistan is included in this database, and the analysis is able to model Pakistan-specific shocks and extract Pakistan-specific results.

LINKAGE is a multi-sectoral, multi-country, and multi-agent dynamic recursive CGE model that assumes perfect competition, with equilibria in a given year being dependent on current year prices and quantities, and the previous year's equilibria. Household demand behavior is modeled using the constant difference of elasticities (CDE) function, while production is assumed to be based on a multi-nested constant elasticity of substitution (CES) function. At the top of the multi-nested structure, an aggregate of intermediate inputs is combined with an aggregate value added under Leontief technology. Unskilled labor is substitutable for a skilled labor and capital composite, while skilled labor and capital are themselves complementary. The model takes a vintage approach to capital in production, so production can occur with either "old capital" or "new capital." The key difference



being that “new capital” is slightly more substitutable (or slightly less complementary) with skilled labor than “old capital.”

Output is produced by different production streams—differentiated by capital vintage. Each production stream has an identical production structure based on a multi-nested Constant Elasticity of Substitution functional form, but with different technological parameters and substitution elasticities. At the top of the nest, a value-added bundle is combined with an intermediate inputs bundle under the Leontief technology assumption. The intermediate inputs bundle is combined with different inputs, with an Armington assumption applied to specific inputs. That is, for a given type of intermediate input, there is substitutability between domestic and imported inputs, and then again between imported inputs from different source countries. The value-added bundle is made up of unskilled labor being slightly substitutable with a capital and skilled labor bundle. Skilled labor and capital are highly substitutable.

LINKAGE also considers segmented labor markets in developing countries, that is, there are separate labor markets for unskilled labor in agriculture and nonagriculture. Endogenous migration of unskilled labor from one market to another within a country is modeled as a function of the wage of unskilled workers in agriculture relative to the wages received by unskilled workers in the nonagriculture market.

Since LINKAGE is a structural microfoundations model that is consistent with neo-classical growth theory, aggregate growth depends on changes in the labor force, the capital stock, and total factor productivity. The economic impact of demographic change must therefore occur through one of these channels, and the key neo-classical growth drivers in LINKAGE that will be sensitive to demographics are the labor force and the capital stock. As a simulation is implemented over time, the skilled and unskilled labor forces for a given country are exogenously changed. At the same time, the model keeps track of the young (less than 15 years of age), working age (15–64 years of age), and elderly (over 64 years of age) populations, from the fertility scenarios of the UN WPP, depending on the scenario. These data are used to calculate the youth and elderly dependency ratios in each year of a given simulation, and are in turn used to help determine domestic savings behavior.

Domestic savings as a share of gross domestic product (GDP) ( $\mu^s$ ) is a linear function of three factors (excluding the persistence effect) and has the following functional form:

$$\begin{aligned} \mu^s = & \alpha^s + \beta^s \mu_{-1}^s + \beta^g \text{LN} \left( \frac{GDP/POP}{GDP_{-1}/POP_{-1}} \right) + \beta^y \left( \frac{POP^{l15}}{POP^{WAP}} \right) \\ & + \beta^e \left( \frac{POP^{g65}}{POP^{WAP}} \right) \end{aligned} \quad \text{EQ. 2}$$

The first factor is for the growth of GDP per capita. The second and third terms are for the youth and elderly dependency ratios, respectively. The function is parameterized following the empirical estimates of Loayza, Schmitt-Hebel, and Serven (2000). These coefficients are constant over the time horizon of the simulations. The coefficients for the growth term are positive for all countries, which implies that as countries grow, they save more. The coefficients on the dependency ratio terms are

negative for all countries. So, as dependency ratios rise, the propensity for households to consume rises and savings as a share of GDP fall, with the magnitudes of the elderly dependency ratio coefficients being greater than that of the young dependency ratio coefficients. Since investment is modeled as being savings driven, total global investment is driven by total global savings, with the amount of investment in a given country being a function of both domestic savings as well as the current account balance, which is determined exogenously. The additional implication of the savings-driven investment assumption is that as dependency ratios fall in a given country, domestic savings will rise, which in turn will boost investment. The opposite would hold true for a country where dependency ratios are rising. The coefficients are differentiated by developed and developing countries, with the savings and investment function for Pakistan using the developing country values. The impact of the changing dependency ratios while modulated by the  $\beta^y$  and  $\beta^e$  (which are the same for all developing countries) will of course vary across countries, since countries have different dependency ratios in the benchmark year and undergo demographic change at different paces.