



## Schooling, learning, and the promise of education

**“No one has yet realized the wealth of sympathy, the kindness and generosity hidden in the soul of a child. The effort of every true education should be to unlock that treasure.”**

EMMA GOLDMAN

**“In the long run, the best way to reduce inequalities with respect to labor as well as to increase the average productivity of the labor force and the overall growth of the economy is surely to invest in education.”**

THOMAS PIKETTY, *CAPITAL IN THE TWENTY-FIRST CENTURY*

Education is a basic human right, and it is central to unlocking human capabilities. It also has tremendous instrumental value. Education raises human capital, productivity, incomes, employability, and economic growth. But its benefits go far beyond these monetary gains: education also makes people healthier and gives them more control over their lives. And it generates trust, boosts social capital, and creates institutions that promote inclusion and shared prosperity.

### Education as freedom

Since 1948, education has been recognized as a basic human right, highlighting its role as a safeguard for human dignity and a foundation of freedom, justice, and peace.<sup>1</sup> In the language of Amartya Sen’s capability approach, education increases both an individual’s assets and his or her ability to transform them into well-being—or what has been called the individual’s “beings and doings” and “capabilities.”<sup>2</sup> Education can have corresponding salutary effects on communities and societies.

Education expands freedom through many channels, both raising aspirations and increasing

the potential to reach them. These benefits are both monetary and nonmonetary for individuals, families, communities, and society as a whole (table 1.1).

Most people—whether policy makers or parents—already recognize the great value of education.<sup>3</sup> Families around the world make great sacrifices to keep their children in good schools, and political and opinion leaders consistently rank education among their top development priorities. For that reason, this chapter does not try to review all the evidence on the benefits of education. But before launching into the main theme of this Report—the learning crisis and what to do about it—it is worth surveying briefly the many ways in which education can contribute to progress, highlighting that these benefits often depend on learning, not just schooling.<sup>4</sup>

### Education improves individual freedoms

#### Education improves economic opportunities

Education is a powerful tool for raising incomes. Education makes workers more productive by giving

**Table 1.1** Examples of education’s benefits

	Individual/family	Community/society
<b>Monetary</b>	Higher probability of employment Greater productivity Higher earnings Reduced poverty	Higher productivity More rapid economic growth Poverty reduction Long-run development
<b>Nonmonetary</b>	Better health Improved education and health of children/family Greater resilience and adaptability More engaged citizenship Better choices Greater life satisfaction	Increased social mobility Better-functioning institutions/service delivery Higher levels of civic engagement Greater social cohesion Reduced negative externalities

Source: WDR 2018 team.

them the skills that allow them to increase their output.<sup>5</sup> Each additional year of schooling typically raises an individual’s earnings by 8–10 percent, with larger increases for women (figure 1.1).<sup>6</sup> This is not just because higher-ability or better-connected people (who would earn more regardless of their schooling) receive more education, as proposed by the signaling model of education. “Natural experiments” from a wide variety of countries—such as Honduras, Indonesia, the Philippines, the United Kingdom, and the United States—prove that schooling does drive the increased earnings (box 1.1).<sup>7</sup>

In well-functioning labor markets, education reduces the likelihood of unemployment. In these economies, high school graduates are less likely than

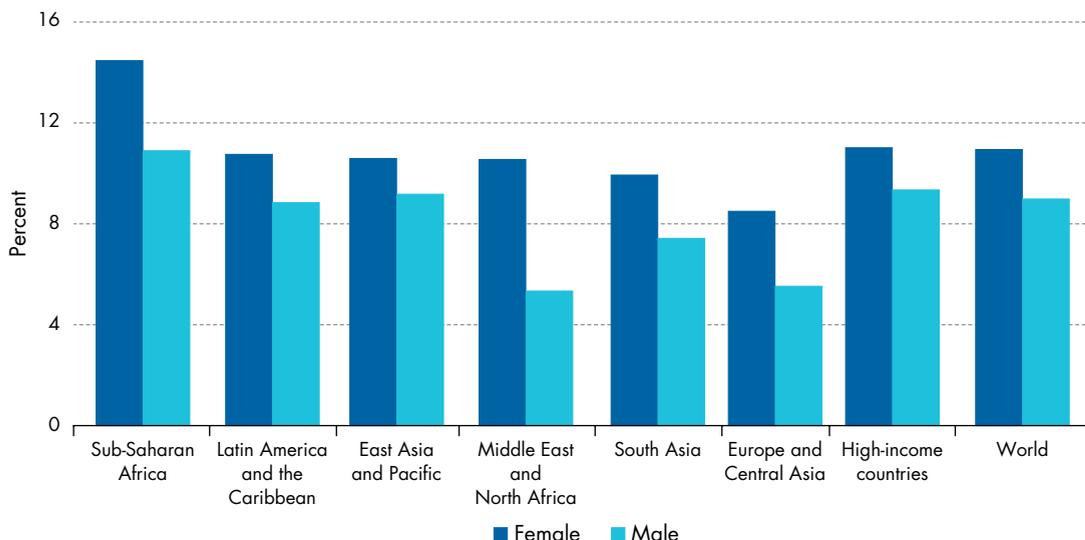
less educated workers to lose their jobs, and if they do they are more likely to find another job. Educated workers are more attached to the firms they work for. They are also more effective at acquiring and processing job search information.<sup>8</sup> Research in Finland and the United States finds that more schooling makes it easier for unemployed people to find reemployment.<sup>9</sup> In less developed economies with large informal sectors and underemployment, education is associated with greater access to full-time jobs in the formal sector.<sup>10</sup>

**Education leads to longer lives and enables better life choices**

Education promotes longer, healthier lives. Around the world, there are strong links among education,

**Figure 1.1** More schooling is systematically associated with higher wages

Median percentage increase in wages associated with each additional year of schooling, by country group and gender



Source: WDR 2018 team, using data from Montenegro and Patrinos (2017). Data at [http://bit.do/WDR2018-Fig\\_1-1](http://bit.do/WDR2018-Fig_1-1).

Note: Figure is based on the latest available data, 1992–2012. Regions do not include high-income countries.

## Box 1.1 Schooling as human capital formation or as a signaling device?

Why is education associated with higher earnings? Unlike the human capital model, which posits that education increases a worker's productivity, the signaling model of education states that individuals acquire education credentials to signal a high ability to potential employers. Having a university degree does signal perseverance, grit, and ability—all valuable skills for the labor market.

But the human capital acquired typically drives the link from schooling to earnings, as different types of evidence show. First, the returns to an additional year of schooling for those who drop out without a high school or university diploma are as large as for those who complete the degree. Second, the wage differentials across education levels rise with age, whereas signaling theory suggests they should

fall, because the usefulness of the signal component would presumably decline with age. Finally, education is an expensive screening strategy.

If education worked only as a screening device, individuals with the same years of schooling should have similar outcomes regardless of the skills they acquired, which is not the case.<sup>a</sup> In many countries, individuals with higher measured skills have been consistently shown to earn more than their lower-skilled peers who have the same amount of schooling.<sup>b</sup> In Mexico, those high school graduates with higher test scores are substantially less likely to be unemployed three years after leaving school (among those who did not go to university) than their lower-scoring peers.<sup>c</sup>

Source: WDR 2018 team.

a. Layard and Psacharopoulos (1974).

b. For example, see the results for Organisation for Economic Co-operation and Development (OECD) countries in Hanushek and others (2015) and Valerio and others (2016). For individual countries such as Ghana, see Glewwe (1991), or for South Africa, see Moll (1998).

c. de Hoyos, Estrada, and Vargas (2017).

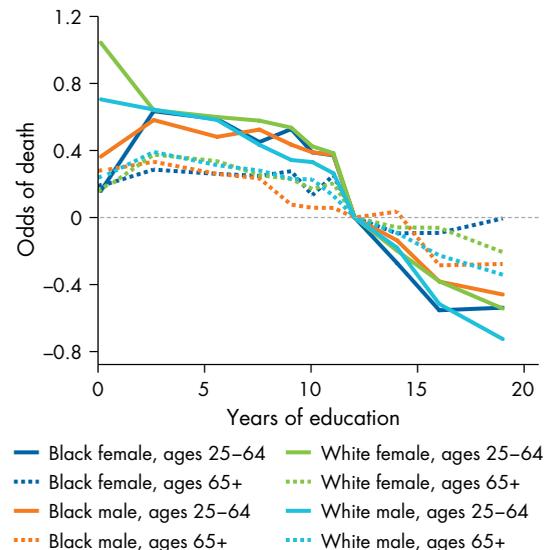
better health outcomes, and longer lives.<sup>11</sup> Regardless of their race, gender, or income, more-educated individuals in Europe and the United States have a lower probability of having a chronic health condition.<sup>12</sup> In the United States, each additional year of schooling is associated with a lower probability of death, especially after high school (figure 1.2). One reason is that education makes people less likely to smoke, drink in excess, be overweight, or use illegal drugs.<sup>13</sup> In the United States, education makes people less likely to smoke; in Uganda, more-educated individuals were more responsive to HIV/AIDS information campaigns.<sup>14</sup>

Educated individuals have more control over the life they want to pursue—often called “agency.” Increased agency manifests itself as a reduction in risky behavior, higher life satisfaction, and greater happiness. Across 52 countries at all income levels in 2010–14, only 1 in 10 university graduates felt that they had little or no control over their lives.<sup>15</sup> When the United Kingdom and the United States extended compulsory schooling, people who received more education were less likely to report being unhappy later in life.<sup>16</sup>

The positive relationship between education and agency is partly mediated by the positive effect of education on income, but there seems to be an

**Figure 1.2 Mortality rates in the United States are lower for adults with more education**

Relative odds (log-odds coefficient) of death for groups with different years of education, by age, gender, and race



Source: WDR 2018 team, using data from Montez, Hummer, and Hayward (2012). Data at [http://bit.do/WDR2018-Fig\\_1-2](http://bit.do/WDR2018-Fig_1-2).

Note: Groups exclude Hispanic population.

independent effect as well: the effects on crime and fertility, for example, are not contingent only on income. Schooling reduces most types of crime committed by adults,<sup>17</sup> as well as crime during late adolescence.<sup>18</sup> Among 16- and 17-year-olds in the United Kingdom, school dropouts are three times more likely to commit crimes than those who have stayed in school, and this gap remains well into their early 20s. In Sweden, the United Kingdom, and the United States, completing high school makes youth less likely to commit crimes, and education is linked with lower crime rates elsewhere—such as in Mexico, where high school dropouts were more caught up in the violence of the war on drugs.<sup>19</sup>

As for fertility, education reduces teen pregnancy and increases the control that women have over the size of their families. Schooling reduces teenage pregnancy indirectly by increasing girls' aspirations, empowerment, and agency. In Turkey, primary school completion induced by a change in compulsory schooling laws—allowing research to isolate the causal effects—reduced teenage fertility by 0.37 children per woman.<sup>20</sup> School subsidies reduced teen pregnancy (and in some cases school dropout) in Brazil, Colombia, Kenya, Malawi, and Peru.<sup>21</sup> More generally, women with more schooling have lower fertility rates. In Brazil, increased schooling among young women explains 40–80 percent of the decline in the fertility rate that began in the late 1960s.<sup>22</sup> When school coverage expanded in Nigeria, each additional year of female schooling reduced fertility by at least 0.26 births per woman.<sup>23</sup> One reason may be that educated women earn more, making it costlier for them to leave the labor market.<sup>24</sup> Education also increases women's use of contraception, increases their role in family decisions on fertility, and makes them more aware of the trade-offs in having children.<sup>25</sup>

### **The benefits of education are long-lasting**

Education can eliminate poverty in families. The incomes of parents and their children are highly correlated: income inequality persists, and poverty is transmitted from one generation to the next.<sup>26</sup> But improving education gives poor children a boost: in the United States, the children of households that moved to a (one standard deviation) better neighborhood had incomes as adults that were more than 10 percent higher, in part because the move improved learning.<sup>27</sup>

Better-educated mothers raise healthier and more educated children. Women's education is linked to many health benefits for their children, from higher immunization rates to better nutrition to lower

mortality.<sup>28</sup> Improvements in women's education have been linked to better health outcomes for their children in many countries, including Brazil, Nepal, Pakistan, and Senegal.<sup>29</sup> Parental schooling robustly predicts higher educational attainment for children, even after controlling for other factors. And children's ability to benefit from education is shaped by their parents' education. In the United States, each additional year of a mother's schooling increases her children's math test scores by 0.1 standard deviation and significantly reduces behavioral problems.<sup>30</sup> In Pakistan, mothers who have one more year of schooling have children who spend an additional hour a day studying at home.<sup>31</sup>

Education's benefits are especially apparent in changing environments. Individuals with stronger skills can take better advantage of new technologies and adapt to changing work. Indeed, experts on technological change have long argued that the more volatile the state of technology, the more productive education is.<sup>32</sup> Returns to primary schooling in India increased during the Green Revolution, with the more educated farmers adopting and diffusing new technologies.<sup>33</sup> More generally, globalization and advances in technology are putting a premium on education and skills—both cognitive and socioemotional (see spotlight 5). New skills facilitate the adoption of technologies and promote innovation,<sup>34</sup> with general skills enabling individuals to adapt to the economic changes that occur over their lifetimes.<sup>35</sup> When the North American Free Trade Agreement (NAFTA) increased labor productivity in Mexico, the benefits were concentrated among more-skilled workers in the richer northern states.<sup>36</sup> In general, returns to education are higher in economically free countries with institutions that allow individuals to adjust to shocks and market forces.<sup>37</sup>

## **Education benefits all of society**

Education builds human capital, which translates into economic growth. If improvements are faster among the disadvantaged, the additional growth will reduce poverty, reduce inequality, and promote social mobility. Through its effect on civic agency—meaning high levels of political engagement, trust, and tolerance—education can create the building blocks for more inclusive institutions.<sup>38</sup> Greater civic agency can create a political constituency for inclusive institutions, strengthening the social contract between the state and its citizens. A more engaged citizenry can also provide political support for the reforms needed to realize the promise of education.

### Education promotes economic growth

At the national level, education underpins growth. 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.<sup>39</sup> Widespread basic education may provide a bigger boost for countries far from the global technological frontier—a group that includes most low- and middle-income countries.<sup>40</sup> These countries do not need to push that frontier out through innovation, but they do need widespread basic education to absorb and adapt the technologies that are already available globally. In countries close to the technological frontier, mainly high-income countries, higher levels of education can boost growth through innovation.<sup>41</sup> Although data limitations make empirical analysis of this relationship challenging, many influential studies have concluded that higher levels of education do drive more rapid growth.<sup>42</sup> Growth accounting analyses also suggest that education can explain a significant share of growth—a share that may be even larger if unskilled workers are more productive when there are more skilled workers in an economy.<sup>43</sup>

But this statistical evidence is not the only—or even the most compelling—evidence on the impact of education on growth. Countries that have sustained rapid growth over decades have typically shown a strong public commitment to expanding education, as well as infrastructure and health.<sup>44</sup> Although the relationship flows the other way as well—in that rapid growth allows greater investment in all three sectors—research on the East Asian miracle countries in particular flags education and human capital as factors in their rapid growth.<sup>45</sup> Countries such as the Republic of Korea reaped the benefits of their “progressive universalism” approach to education, in which they ensured high-quality basic education

for all children early on, followed by expansion of high-quality secondary and tertiary opportunities.<sup>46</sup> These cases reinforce the idea that strong foundational skills drive growth early in development, but also that as countries approach the global technological frontier, they need to invest more in higher education and in research and development.<sup>47</sup>

As education coverage expands, poor people typically benefit the most at the margin, and so income inequality should fall.<sup>48</sup> A review of more than 60 studies reveals that greater education coverage is associated with substantial reductions in the income gap between households across the income distribution. Specifically, going from a primary enrollment rate of 50 to 100 percent is associated with an 8 percentage point increase in the share of income going to households in the poorest decile.<sup>49</sup>

### Education creates the building blocks for inclusive institutions

Education strengthens the political development of nations by promoting the civic engagement of their populations.<sup>50</sup> People with more education consistently participate more in political activities than those with less education: education increases awareness and understanding of political issues, fosters the socialization needed for effective political activity, and increases civic skills.<sup>51</sup> Evidence from a variety of settings shows that this relationship is causal.<sup>52</sup> In the United States, getting more education—for example, as a result of preschool programs, high school scholarships, or smaller class sizes—leads people to vote more often (table 1.2).<sup>53</sup> Using changes in compulsory school laws to identify the causal impact of education confirms these findings for the United Kingdom and the United States, while using access to community college or changes in child labor laws does so for the United States.<sup>54</sup> In Benin, receiving more education made people more politically active over their lifetimes. In Nigeria, too, educational

**Table 1.2** More schooling leads to more voting

Percent

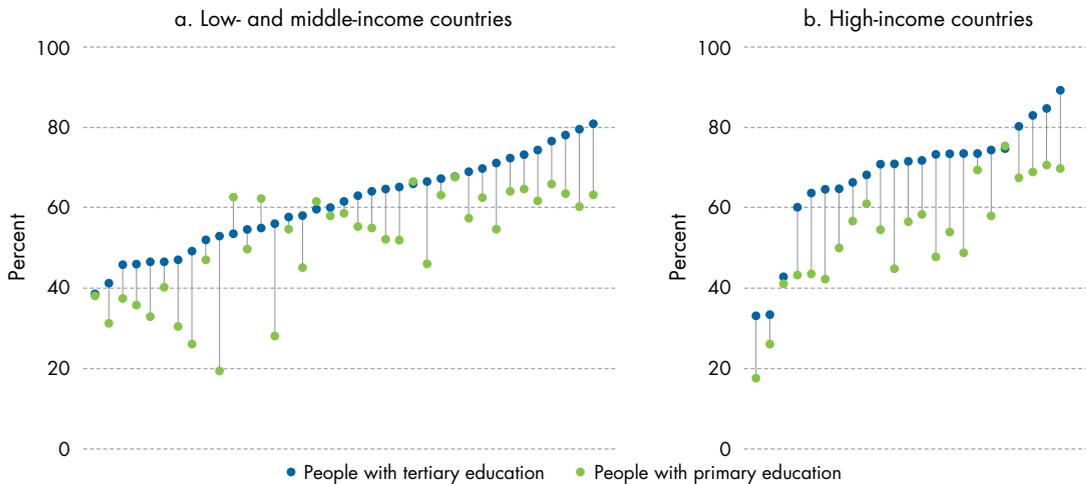
Program	Graduated from high school		Voted	
	Control	Treatment	Control	Treatment
Perry Preschool experiment	44	65	13	18
“I Have a Dream” scholarships	62	79	32	42
STAR Experiment	85	90	42	47

Source: Sondheim and Green (2010).

Note: The Perry Preschool experiment was an intensive effort to enroll children from low-income families in preschool in Ypsilanti, Michigan. The “I Have a Dream” scholarships were high school scholarships targeted to fifth-grade students who qualified (because of their family’s poverty status) for free or reduced-price lunch in Lafayette, Colorado. The STAR Experiment assigned some students in kindergarten through grade 3 in Tennessee to smaller class sizes. The measure of voting differs across the studies, but corresponds to a time between 2000 and 2004 when the participants would have already graduated from high school.

### Figure 1.3 People with higher education hold stronger beliefs about the importance of democracy

Percentage of population that believes it is “absolutely important to live in a democracy,” by country and level of education



Source: WDR 2018 team, using data from World Values Survey (World Values Survey Association 2015). Data at [http://bit.do/WDR2018-Fig\\_1-3](http://bit.do/WDR2018-Fig_1-3).

expansion substantially increased the civic and political engagement of its beneficiaries decades later.<sup>55</sup>

As with the other effects of education, context matters in how education affects political views and engagement. In an indicator of perceptions of one common mechanism for political participation, surveys in 30 developing countries show that more-educated citizens are more likely to believe that living in a democracy is important (figure 1.3). But in Kenya, although more education caused young women to have more political knowledge, it also led them to be more disenchanted and more accepting of political violence, perhaps because democratic institutions were particularly fragile at the time of the research.<sup>56</sup>

Education increases trust, tolerance, and civic agency. Evidence from member countries of the Organisation for Economic Co-operation and Development (OECD), as well as from developing countries, indicates that more-educated individuals are more trusting and tolerant of people they know and even of strangers.<sup>57</sup> Although such cross-sectional evidence cannot prove a causal relationship, historical analysis suggests a mechanism: the spread of literacy may have contributed to a generalized decline in violence after the Middle Ages, because the ability to read others’ viewpoints promoted empathy.<sup>58</sup> Some educational environments appear to promote trust especially well. Data for 28 countries reveal that the openness of a classroom climate, or the “degree to which students are able to discuss political and social issues in class,” is positively linked to trust and tolerance.<sup>59</sup> Similarly,

teaching styles that encourage teamwork rather than a more top-down pedagogy appear to promote social capital: students are more likely to believe in the importance of civic life and the value of cooperation.<sup>60</sup>

Education makes institutions work better and improves public services. Educated parents are better able to leverage decision-making authority at the school level. In The Gambia, a school-based management program improved student learning—but only when there was a high level of literacy in the village.<sup>61</sup> A more educated population generally demands more transparent use of public resources, better service delivery, and government accountability. Recent cross-country research identifies citizen complaints as a primary mechanism: educated citizens complain more, inducing officials to behave better.<sup>62</sup> Education also appears to improve dimensions of governance: countries that had achieved mass education by 1870 had less corruption in 2010.<sup>63</sup>

Growth built on human capital rather than other sources (such as natural resources) may lead to fewer incentives for conflict, for three main reasons.<sup>64</sup> First, because human capital is difficult to appropriate, conquest of a well-educated population may be less rewarding than seizure of natural resources or even physical capital.<sup>65</sup> Second, education raises the opportunity cost of fighting: it is easier to recruit people who have poor job prospects.<sup>66</sup> Third, as discussed, education can promote tolerance and cooperation, thereby reducing the propensity to turn to violence to resolve conflicts.<sup>67</sup>

## Learning and the promise of education

Education can be a powerful tool for individual and societal empowerment, but its benefits are not automatic. It is not just that education cannot do it alone, in that much also has to go right in other sectors of

the economy and society (box 1.2). Another problem is that if an education system is managed poorly, it can promote social “bads” instead of social “goods.” First, education can deepen cleavages between favored and disadvantaged groups. Young people from poor, rural, and otherwise disadvantaged households not only complete less schooling, but also learn much

### Box 1.2 Education can't do it alone

Economics, politics, and society shape the returns to education. Education systems do not function in a vacuum; they are part of broader economic, political, and social institutions. For example, does a society uphold property rights? If not, entrepreneurs are unlikely to invest in risky new ventures, which cuts into job creation and reduces education's returns in the labor market. Are there regulations to prevent fraud? If not, those with education might find it more profitable to engage in socially unproductive but financially remunerative activities. Are women restricted from working outside the home? If so, the economic returns from education will be unavailable to them. These are all examples of how formal or informal institutions influence education's returns. In general, reliable institutions that implement the rule of law, reduce corruption, and protect property rights are associated with higher returns to human capital.<sup>a</sup>

Here are several examples of how problems elsewhere in the economy or society reduce education's returns:

*Low demand for educated labor reduces the return to skills.* Education's returns depend on the interplay between demand and supply forces in the labor market. If the demand for educated labor is low relative to supply, then the returns to education will be low or declining.<sup>b</sup> In urban China, the returns to education rose from 4 percent a year of schooling in 1988 to 10 percent in 2001, with most of the increase attributable to institutional reforms that increased the demand for skilled labor.<sup>c</sup> More generally, shifts from planned to market economies have increased the returns to human capital.<sup>d</sup> When the investment climate is poor,<sup>e</sup> both investment and demand for labor by private firms are lower, reducing the returns to education.<sup>f</sup>

*Countries can incentivize the wrong things.* Many educated youth in parts of the developing world queue for jobs in already large public sectors. In several countries, political candidates compete in terms of their ability to offer patronage or public employment to their supporters.<sup>g</sup> In several North African countries, for example, it was not uncommon in the past for governments to guarantee public employment opportunities for all university graduates, and the public sector remains the employer of a large share of wage earners.<sup>h</sup> In such situations, individual returns to

education might be high (for those who land public sector jobs), but the impact of education on growth will be low because improved cognitive skills are not used in ways that will increase productivity the most.<sup>i</sup>

*Discriminatory norms distort the benefits of education.* Prevailing norms on ethnic or gender discrimination can strongly mediate the returns to education for these groups. In many societies, social norms severely restrict women's access to economic opportunities.<sup>j</sup> Two studies found that nearly 90 percent of women in northern India (from the state of Uttar Pradesh) and Nigeria (of Hausa ethnicity) felt they needed their husband's permission to work. But norms vary substantially: in the Ethiopian capital, this share was only 28 percent.<sup>k</sup>

Such norms do not always operate through open discrimination. Labor market segregation along occupational and social lines is often covert. Occupational gender segregation is a strong feature of many labor markets across the world.<sup>l</sup> In Organisation for Economic Co-operation and Development (OECD) countries, women dominate the service sector, whereas men are overrepresented in industry.<sup>m</sup> In addition to horizontal segregation, women also face a “glass ceiling” or “vertical segregation” because they do not advance in their careers as fast or as far as men. In OECD countries, just a third of managers were women in 2013, with small variations across countries.<sup>n</sup> Labor market segregation may also exist along socioeconomic lines.<sup>o</sup> In the 1960s and 1970s, during a period of rapid economic growth in Chile, education was significant in determining occupational attainment for the middle class. For the upper class and the very poor, education was less important, and intergenerational status inheritance was much more likely.<sup>p</sup> In Jamaica, a country with a rigid class structure, the massive expansion of educational opportunities at the secondary level did little to increase the permeability of social structure.<sup>q</sup>

The very people who are constrained by social norms may become complicit in perpetuating them. A study of students newly admitted to an elite master's in business administration (MBA) program in the United States found that single women reported lower desired compensation when they believed their classmates would see their responses. No such differences were observed for men or for women

(Box continues next page)

## Box 1.2 Education can't do it alone (continued)

who were not single, suggesting that single women were reluctant to signal personality traits, such as ambition, that they perceived to be undesirable in the marriage market.<sup>f</sup> Social norms can operate in much the same way to inhibit male access to opportunities. Case studies in Australia and Jamaica suggest that underachievement among boys is linked to notions of education being a “feminized” realm that clashes with expectations of “masculine” behavior.<sup>g</sup>

When getting a job depends on informal institutions, education is less useful.<sup>h</sup> In Kolkata (formerly Calcutta), India,

45 percent of employees reported that they helped a friend or relative get a job with their current employer.<sup>i</sup> Nearly 60 percent of enterprises surveyed in 14 countries in Sub-Saharan Africa report that their most recent position was filled through contacts with “family/friends.”<sup>j</sup> This finding applies as well to places where labor markets are segmented by kinship and socioeconomic class.<sup>k</sup> Informal networks can also be particularly important for certain subpopulations—for example, among Mexican migrants in the United States.<sup>l</sup>

Source: WDR 2018 team.

- a. World Bank (2011).
- b. Pritchett (2001).
- c. Zhang and others (2005).
- d. Nee and Matthews (1996).
- e. World Bank (2012).
- f. Almeida and Carneiro (2005); Besley and Burgess (2004); Botero and others (2004); Djankov and others (2002); Haltiwanger, Scarpetta, and Schweiger (2008); Klapper, Laeven, and Rajan (2004); Micco and Pagés (2007); Petrin and Sivasadan (2006).
- g. Cammett (2009); Kao (2012); Lust-Okar (2009); Sakai, Jabar, and Dawod (2001).
- h. Bteddini (2016); Egypt Census, 2006, Egypt Data Portal, Central Agency for Public Mobilizations and Statistics, Cairo, <http://egypt.opendataforafrica.org/EGSNS2006/egypt-census-2006>; Ghafar (2016).
- i. Pritchett (2001).
- j. Chiswick (1988); Goldin and Polachek (1987); McNabb and Psacharopoulos (1981); World Bank (2011).

- k. World Bank (2011).
- l. Hegewisch and Hartmann (2014).
- m. OECD Employment Statistics Database, <http://stats.oecd.org>.
- n. OECD Family Database, <http://www.oecd.org/els/family/database.htm>.
- o. First described by Blau and Duncan (1967).
- p. Farrell and Schiefelbein (1985).
- q. Strudwick and Foster (1991).
- r. Bursztyrn, Fujiwara, and Pallais (2017).
- s. Jha and Kelleher (2006).
- t. Granovetter (1995).
- u. Beaman and Magruder (2012).
- v. Filmer and Fox (2014).
- w. Assaad (1997); Barsoum (2004); Brix, Lust, and Woolcock (2015).
- x. Munshi (2003).

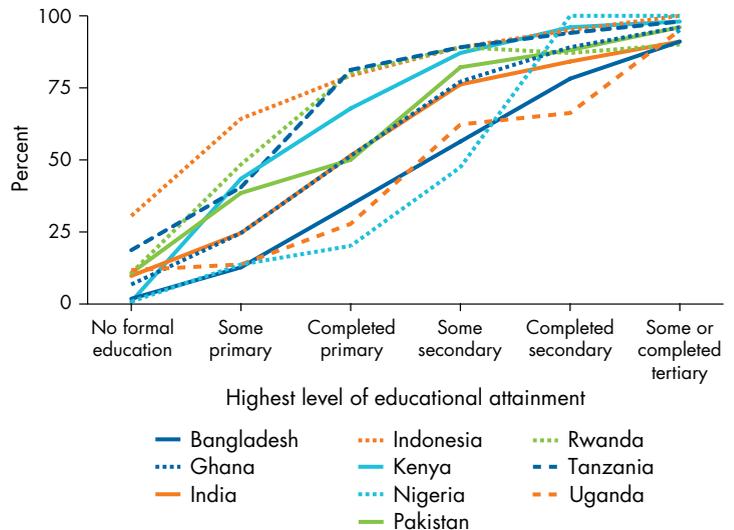
less while in school (see part II of this Report). In such cases, education does little to enhance social mobility. Second, leaders sometimes abuse education systems for political ends and in ways that reinforce autocracy or the social exclusion of certain groups.

Finally, schooling is not the same as learning. *Education* is an imprecise word, and so it must be clearly defined. *Schooling* is the time a student spends in classrooms, whereas *learning* is the outcome—what the student takes away from schooling. This distinction is crucial: around the world, many students learn little (figure 1.4). To be sure, many students learn something, even in settings facing huge challenges. And students enjoy some benefits from education regardless of whether they are learning. When schools serve as oases of security in violent areas, or when participation in schooling keeps adolescent girls from becoming pregnant, these are real societal benefits. When graduates can use their degrees to open doors to employment, that opportunity changes their lives, even when the degree represents less learning than it should.

Intuitively, many of education's benefits depend on the skills that students develop in school. As workers,

**Figure 1.4 Learning varies widely across countries; in 6 of the 10 countries assessed, only half or fewer of primary completers can read**

Literacy rates at successive education levels, selected countries



Source: Kaffenberger and Pritchett (2017). Data at [http://bit.do/WDR2018-Fig\\_1-4](http://bit.do/WDR2018-Fig_1-4).

Note: Literacy is defined as being able to read a three-sentence passage either “fluently without help” or “well but with a little help.”

people need a range of skills—cognitive, socioemotional, technical—to be productive and innovative. As parents, they need literacy to read to their children or to interpret medication labels, and they need numeracy to budget for their futures. As citizens, people need literacy and numeracy, as well as higher-order reasoning abilities, to evaluate politicians’ promises. As community members, they need the sense of agency that comes from developing mastery. None of these capabilities flows automatically from simply attending school; all depend on learning while in school.

Research on the benefits of education has begun to reflect this distinction between schooling and learning. In the past, most empirical research equated education with schooling—whether measured by school enrollment, number of years of schooling, or degrees acquired—in part because of lack of other good measures of education. But as the focus on learning has grown, some studies have explored the effects of the skills that students acquire. The results confirm the intuition: skills matter.

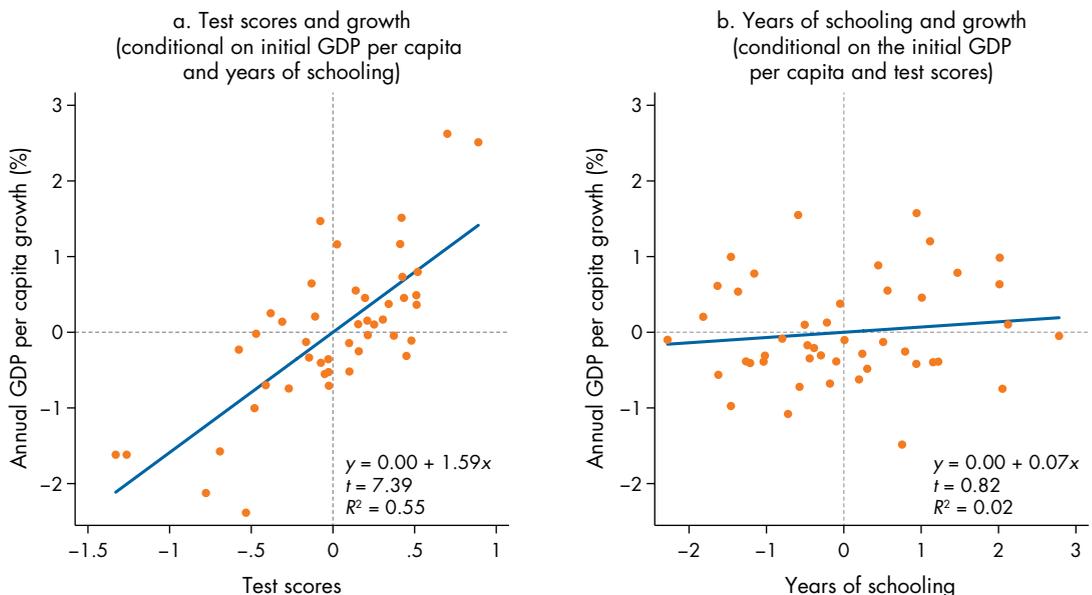
The channel by which schooling accelerates economic growth appears to be through boosting learning and skills.<sup>68</sup> Thanks to the growing availability of large-scale student assessments, it is now possible to explore how learning mediates the relationship from schooling to economic growth.<sup>69</sup> While the relationship between test scores and growth is strong even

after controlling for the years of schooling completed, years of schooling do not predict growth once test scores are taken into account (figure 1.5), or they become only marginally significant.<sup>70</sup> In other words, what matters is less the years of education completed than the knowledge that students acquire while in school. Simulations show that providing all students with basic cognitive skills could massively boost economic outcomes, especially in developing countries (figure 1.6).<sup>71</sup> This finding suggests that cross-country comparisons of the years of schooling completed—especially when used to explain economic phenomena—could be misguided if they do not account for the differences in skills acquired during those years (box 1.3).

At the micro level, too, growing evidence shows that skills acquisition determines how much individuals gain from schooling. For example, learning—not just schooling—matters in how education affects earnings. Across 23 OECD countries, as well as in a number of other countries, simple measures of foundational skills such as numeracy and reading proficiency explain hourly earnings over and above the effect of years of schooling completed.<sup>72</sup> These effects extend beyond the labor market. Across 10 low- and middle-income countries, schooling improved measures of financial behavior only when it was associated with increased reading ability.<sup>73</sup> When people

### Figure 1.5 What matters for growth is learning

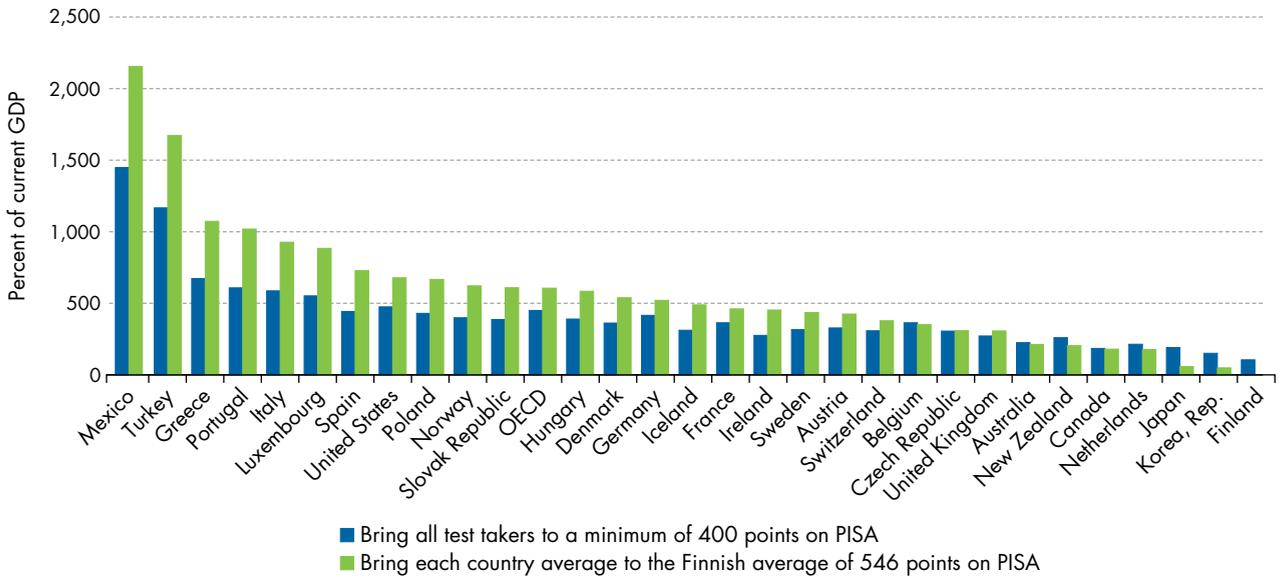
Annual average per capita growth in GDP, 1970–2015, conditional on test scores, years of schooling completed, and initial GDP per capita



Source: WDR 2018 team, using data on test scores from Hanushek and Woessmann (2012) and data on years of schooling and GDP from the World Bank’s World Development Indicators (database), 2017. Data at [http://bit.do/WDR2018-Fig\\_1-5](http://bit.do/WDR2018-Fig_1-5).

## Figure 1.6 Increasing learning would yield major economic benefits

Simulated additional GDP between 2015 and 2090 attributable to increased learning (relative to current GDP), by scenario, selected countries



Source: OECD (2010). Data at [http://bit.do/WDR2018-Fig\\_1-6](http://bit.do/WDR2018-Fig_1-6).

Note: PISA = Programme for International Student Assessment.

had acquired more schooling but not more literacy—which was common in these countries—financial behaviors did not change. Socioemotional skills matter as well: various measures have been shown to significantly predict earnings over and above the effects of schooling and cognitive skills.<sup>74</sup>

Learning matters for health, too. Numerous studies have documented the benefits of girls' schooling on outcomes such as lower fertility or better child survival, but these studies do not typically distinguish between learning and schooling. There are exceptions, however. In Morocco, research showed that maternal education improved child health through its effects on the ability of mothers to acquire health knowledge.<sup>75</sup> Globally, data from 48 developing countries show that learning is responsible for much of these gains. Each additional year of female primary schooling is associated with roughly six fewer deaths per 1,000 live births, but the effect is about two-thirds larger in the countries where schooling delivers the most learning (compared with the least).<sup>76</sup>

Even limited measures of skills explain a lot. The measures used in the studies just noted are often narrow, capturing only simple numeracy or reading proficiency. Sometimes, the measures are coarse. For example, the 48-country study of the relationship between schooling and health uses as its measure of literacy whether a woman can read a single sentence

such as “Parents love their children” or “Farming is hard work.” Yet even these highly imperfect measures of skills have considerable predictive and explanatory power. If better measures of skills were available, skills would likely explain even more of the impacts of education—and the role remaining for the simple schooling measure (which typically retains predictive power in these analyses) would be further diminished.

Finally, learning promotes social mobility. The research cited earlier on intergenerational social mobility in the United States also investigated which educational mechanisms were responsible. One candidate is school quality based on inputs, such as school spending and class size, and these measures did have some predictive power. But learning outcomes turn out to be especially important: the test scores of the community in which a child lives (adjusted for the income of that community) are among the strongest predictors of social mobility later in life.<sup>77</sup>

The literature on the benefits of learning is still growing, with much more research needed. But both common sense and the emerging research literature make it clear that if investigators care about the benefits of education, they should focus on whether students are learning—not just on how well schools are equipped or even how long students stay in school. Part II of this Report takes up this issue.

### Box 1.3 Comparing attainment across countries and economies—learning-adjusted years of schooling

A given number of years in school leads to much more learning in some economies than in others. Because they do not account for these differences, standard comparisons of schooling attainment may be misleading. But how should they be adjusted to make meaningful comparisons?

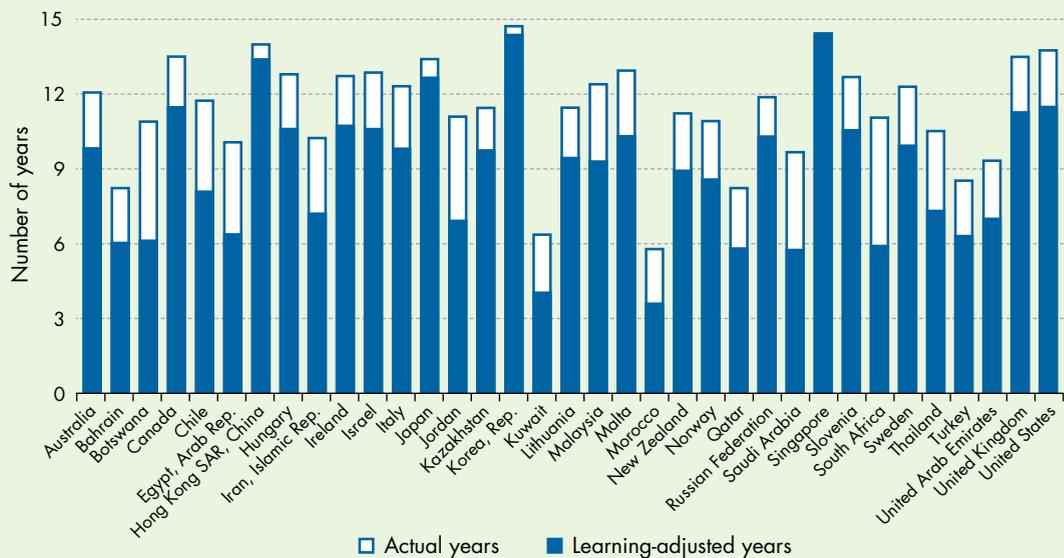
One approach is to draw on measures of student learning that are standardized across different economies to adjust for quality. International assessments such as the Trends in International Mathematics and Science Study (TIMSS) or the Programme for International Student Assessment (PISA) provide such measures. If one is willing to assume that the average learning trajectory across economies is linear—starting at no learning when learners enter school and growing at a constant rate to grade 8—then the ratio of scores across two economies would reflect the relative learning per year in one economy versus the other. For example, if economy A has twice the score of economy B in grade 8, then, on average, a year of schooling in economy A may be considered twice as effective.

Two important facts support the credibility of this analysis: first, the TIMSS score ratios across economies for grade 4 are similar to those for grade 8; and second, PISA scores tend to increase linearly across the grades in which that test is administered.

What might such an adjustment reveal? An illustration using TIMSS math scores from 2015 confirms that years of schooling are indeed very different from learning-adjusted years, and this difference varies a lot across economies. Whereas people ages 25–29 in Hong Kong SAR, China, and the United States have similar average years of schooling (14 and 13.5, respectively), the number of learning-adjusted schooling years in the United States is almost two years less (figure B1.3.1). And whereas young Singaporeans have only 30 percent more schooling than young Jordanians by the standard measure, the learning-adjusted measure shows Singapore outpaces Jordan by 109 percent in effective schooling years.

**Figure B1.3.1** There can be a large gap between learning-adjusted and unadjusted years of schooling

Years of actual and learning-adjusted schooling among young people, ages 25–29, illustrated using TIMSS data



Source: WDR 2018 team, using data from Barro and Lee (2013) and TIMSS 2015 (Mullis and others 2016). Data at [http://bit.do/WDR2018-Fig\\_B1-3-1](http://bit.do/WDR2018-Fig_B1-3-1).

Note: Years of schooling in Singapore are the same as learning-adjusted years because Singapore, which scored highest on the Trends in International Mathematics and Science Study (TIMSS) mathematics assessment in 2015, serves as the basis for comparison in this illustration. For the purposes of this illustration, data for years of education in the United Kingdom are adjusted using the TIMSS score for England. Note that for all countries and economies, the size of the adjustment will reflect the scale of the metric used to make it.

## Notes

1. United Nations (1948). Article 26 of the Universal Declaration of Human Rights (1948) states: “Everybody has the right to education. . . . Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities for the maintenance of peace.”
2. Sen (1985, 1999, 2004).
3. For example, see UNESCO (2016) for a comprehensive discussion of the role of education in the United Nations’ Sustainable Development Goals.
4. Heckman and others (2014).
5. Becker (1964).
6. Montenegro and Patrinos (2017).
7. Angrist and Krueger (1992); Bedi and Gaston (1999); Card (1993); Duflo (2000); Harmon and Walker (1995); Maluccio (1998).
8. Mincer (1991).
9. Kettunen (1997); Riddell and Song (2011).
10. Filmer and Fox (2014).
11. See Cutler, Lleras-Muney, and Vogl (2008) and Vogl (2012) for a review of the evidence in developed and developing countries, respectively.
12. Cutler and Lleras-Muney (2007); Mackenbach (2006).
13. Although there is reverse causality—better health leads to more education—natural experiments such as the introduction of minimum schooling laws or military draft avoidance have identified the positive and significant causal effects of education on health.
14. de Walque (2007a, 2007b).
15. The World Values Survey 2010–14 (Wave 6) covers 57 developed and developing economies (World Values Survey Association 2015). The survey measures the beliefs, values, and motivations of 90,000 survey respondents selected in nationally representative samples, while also collecting socioeconomic data from those respondents. Estimations include average weights and consolidated categories for analysis (education level and scaled responses).
16. Oreopoulos (2007).
17. Lochner (2004); Lochner and Moretti (2004).
18. Belfield and others (2006); Cullen, Jacob, and Levitt (2006).
19. Anderson (2014); de Hoyos, Gutiérrez Fierros, and Vargas M. (2016); Hjalmarsson, Holmlund, and Lindquist (2015); Machin, Marie, and Vujić (2011). At least two possible mechanisms could explain why education reduces crime. First, because education increases potential earnings, it also drives up the opportunity costs of crime. Second, more schooling may reduce crime simply by reducing the time available to young people to commit a crime. Some U.S. data support this “incapacitation effect” (Anderson 2014).
20. Güneş (2016).
21. Azevedo and others (2012); Baird and others (2010); Duflo, Dupas, and Kremer (2014).
22. Lam, Sedlacek, and Duryea (2016).
23. Osili and Long (2008).
24. Becker, Cinnirella, and Woessmann (2013).
25. Lavy and Zablotsky (2011).
26. Solon (1999).
27. Chetty, Hendren, and Katz (2016).
28. Schultz (1975); Thomas, Strauss, and Henriques (1990); Welch (1970); World Bank (2011).
29. World Bank (2011).
30. Carneiro, Meghir, and Pary (2013).
31. Andrabi, Das, and Khwaja (2012).
32. Nelson and Phelps (1966).
33. Foster and Rosenzweig (1996).
34. Aghion and others (2009).
35. Hanushek and others (2017).
36. Hanson (2007).
37. King, Montenegro, and Orazem (2012).
38. Chong and Gradstein (2015); Dahl (1998); Dewey (1916).
39. Romer (1990); Solow (1956).
40. Aghion (2009); Madsen (2014).
41. Acemoglu, Aghion, and Zilibotti (2006); Aghion (2009); Aghion and others (2009).
42. Barro (2001); Cohen and Soto (2007); Glewwe, Maiga, and Zheng (2014); Krueger and Lindahl (2001); Mankiw, Romer, and Weil (1992).
43. Bosworth and Collins (2003); Jones (2014).
44. Commission on Growth and Development (2008).
45. World Bank (1993).
46. Education Commission (2016).
47. Aghion and Howitt (2006).
48. Lanjouw and Ravallion (1999); Younger (2003).
49. Abdullah, Doucouliagos, and Manning (2015).
50. Dewey (1916); Lipset (1959, 1960).
51. Campante and Chor (2012).
52. Chzhen (2013).
53. Sondheimer and Green (2010).
54. Dee (2004); Milligan, Moretti, and Oreopolous (2004).
55. Larreguy and Marshall (2017); Wantchekon, Klasnja, and Novta (2015).
56. Friedman and others (2011).
57. Borgonovi and Burns (2015); Chzhen (2013).
58. Pinker (2011).
59. Campbell (2006).
60. Algan, Cahuc, and Shleifer (2013).
61. Blimpo, Evans, and Lahire (2015).
62. Botero, Ponce, and Shleifer (2013).
63. Chong and others (2014).
64. de la Brière and others (2017).
65. Acemoglu and Wolitzky (2011).
66. Collier, Hoeffler, and Rohner (2009).
67. Davies (2004).
68. Glewwe, Maiga, and Zheng (2014); Hanushek and Woessmann (2008, 2012).
69. Barro (2001, 2013).
70. Barro (2013).
71. Hanushek and Woessmann (2015); OECD (2010).
72. Hanushek and others (2015); Valerio and others (2016).
73. Kaffenberger and Pritchett (2017).

74. For OECD countries, see Heckman, Stixrud, and Urzua (2006); Heineck and Anger (2010); Mueller and Plug (2006). For countries outside of OECD, see Díaz, Arias, and Tudela (2012); Valerio and others (2016).
75. Glewwe (1999).
76. Oye, Pritchett, and Sandefur (2016).
77. Chetty and others (2014).

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