

# Introduction

Human capital is considered an important determinant of economic growth and an effective vehicle for reducing inequality and absolute poverty. When countries invest in human capital through education, there is the potential for generating benefits to society that go beyond those acquired by the individuals involved. Available evidence suggests that education is associated with lower fertility rates, healthier and better-educated children, and stronger national identity. Not surprisingly, most developing countries, including those in the MENA region, have committed substantial resources over the last 40 years to expand and improve their education systems.

Attaining the above benefits from investing in human capital through education is not automatic, however. All too often, higher investment in education is not associated with faster economic growth, especially when the system fails to produce the level, mix, and quality of skilled labor required to meet demand or when demand itself is inadequate or distorted. Similarly, poor-quality education effectively erodes its returns, leading to high dropout rates, especially among the poor. Finally, rather than enhancing social cohesion, improving health outcomes, and strengthening the future development capacity of a nation, education is sometimes used by vested interest groups to advance particular causes at the expense of the broader public good.

In light of the uncertainty surrounding the outcomes of investment in education, Part I of this report—The Case for Education Reform in the MENA Region—explores the extent to which MENA countries have been successful in their effort at making education work for development. More concretely, chapter 1 documents MENA's investment in human capital through education over the past 40 years or so, and shows how this investment has affected education outcomes. Chapter 2 explores the extent to which investment in education has been translated into higher economic growth, improved income equality, and lower poverty in the region. Chapter 3 analyzes the state of readiness of the education systems in the region to deal with such new challenges as glob-

alization and the knowledge economy, demographic pressure, and finance of education.

The upshot of the analysis is that MENA countries have committed more resources to education than other developing countries at a similar level of per capita income. As a result, the region was able to improve access to education at all levels of instruction for boys and girls at rates not previously seen in the developing world. The main shortcoming of past efforts lies in the weak link between the improvements in the level, quality, and distribution of human capital and economic growth, income distribution, and poverty reduction. Past investments in education have not generated the maximum benefits to individuals and society. Thus, the case for education reform is compelling. This case is further reinforced by the lack of readiness of most education systems in the region to deal with globalization and the increasing emphasis on knowledge in the development process, the region's enormous youth bulge, and the additional financial resources required to expand higher levels of instruction, having essentially achieved full enrollment at the primary level.

# Investment in Education

How much have MENA countries invested in human capital through education over the past four decades? What has been the impact of this investment on the *level*, *quality*, and *distribution* of human capital? What has been the impact on such human indicators as fertility and infant mortality rates as well as life expectancy? How well did the region perform in accumulating human capital compared with other developing countries? These are the questions addressed in this chapter.

The value of reviewing how much or how little countries in the region have invested in human capital through education is that it documents progress made to date. It also situates the region relative to other developing countries, especially in a world of increasing capital mobility. In addition, the review sets the stage for exploring the relationship among human capital and economic growth, income distribution, and poverty reduction in chapter 2.

This chapter is organized into four sections: the first three examine investment in education under three facets of human capital: its level, its quality, and its distribution. The fourth section is devoted to noneconomic returns. Although all of these facets of human capital are related to each other, as will be noted occasionally, they are addressed separately for the sake of clarity.

## Investment in Education and the Level of Human Capital

A number of measures are effective in gauging a country's effort to increase the level of human capital through education, including public spending,<sup>1</sup> enrollment rates, and the number of years of schooling. A historical and comparative assessment of the effort made by MENA countries along these dimensions is presented in the following paragraphs.

## Public Sector Spending on Education

The MENA region does well on spending on education as a proportion of GDP compared to East Asia and Latin America (table 1.1). In the period 1965–2003, MENA governments spent an average of approximately 5 percent of their GDP on education, whereas our sample of East Asian and Latin American countries spent closer to 3 percent. In recent years, the proportion of GDP spent by MENA governments as a whole exceeded those of East Asia and Latin America by about 1.5 percentage points.<sup>2</sup>

In terms of public expenditure per pupil, MENA countries also spend on average more per student at all levels of education than do our sample of comparator countries. This observation is supported by the figures presented in table 1.2, which are reported in 2000 dollars after adjusting for purchasing power parity (PPP) to reflect differences in the price of a basket of consumption goods across countries.

These figures confirm the strong collective effort to invest in education in the MENA region. However, they also reveal that most MENA countries are placing more public effort *per pupil* into secondary than into primary education and, to a greater extent, into tertiary than into secondary education.<sup>3</sup> This pattern of spending favors children in families of higher social class, who are likely to send their children to university. Conversely, if most of the spending were allocated to primary schooling, this would imply greater investment in a broader portion of the population.

## Enrollment Rates

The large amount of spending on education as a percent of GDP in the MENA region has successfully increased enrollment. Indeed, net enrollment rates, measured as the percentage of number of pupils enrolled who are of the official age group for a given level of education in that age group, improved significantly over time. If the current level of effort is sustained, the region can catch up with other regions in the near future. More concretely, the majority of MENA countries were able to achieve almost universal enrollment in primary education and even completion of fifth grade as a percentage of the age cohort (table 1.3).

With some exceptions (e.g., Djibouti, Saudi Arabia, and the Republic of Yemen), MENA countries are educating most young people, both boys and girls, at the primary level.

Similar progress has been made with respect to the proportion of the age cohort attending secondary school and university. The data presented in table 1.4 indicate that the MENA region was able to increase

TABLE 1.1

### Average of Public Expenditure in Education as a Percentage of GDP, 1965–2003

	1965–74	1975–84	1985–94	1995–2003
Algeria	6.2	6.1	7.2	6.1
Bahrain	—	3.3	4.1	3.6
Djibouti	—	—	3.3	5.7
Egypt, Arab Rep. of	4.7	5.4	4.8	5.6
Iran, Islamic Rep. of	—	5.0	4.2	4.6
Iraq	—	4.4	4.4	—
Jordan	3.2	5.2	6.1	6.4
Kuwait	—	4.1	7.1	6.3
Lebanon	—	—	2.0	2.9
Libya	—	5.2	8.4	—
Morocco	3.4	6.3	5.6	5.9
Oman	—	2.1	3.6	3.9
Qatar	—	3.6	4.0	—
Saudi Arabia	3.6	6.7	7.2	6.3
Syrian Arab Rep.	3.3	5.4	4.3	3.2
Tunisia	6.2	5.2	5.9	6.8
United Arab Emirates	—	1.3	2.0	1.7
West Bank and Gaza	—	—	—	9.5
Yemen, Rep. of	—	—	5.6	5.8
<b>Mean</b>	<b>4.4</b>	<b>4.6</b>	<b>5.0</b>	<b>5.3</b>
China	1	2.4	2.3	2.3
Indonesia	2.6	2.1	1.1	1.2
Korea, Rep. of	2.7	3.6	3.8	3.9
Malaysia	4.1	6.1	5.5	6.2
Philippines	—	1.8	2.4	3.4
Thailand	2.8	3.6	3.6	4.8
<b>Mean</b>	<b>2.6</b>	<b>3.3</b>	<b>3.1</b>	<b>3.6</b>
Argentina	1.9	2.1	2.2	4.1
Brazil	—	3.3	4.1	3.6
Chile	4	4.6	3.0	3.7
Mexico	2.3	4.3	3.7	5.0
Peru	3.7	3.0	3.1	3.1
<b>Mean</b>	<b>3.0</b>	<b>3.4</b>	<b>3.2</b>	<b>3.9</b>

**Sources:** UNESCO Institute for Statistics through EdStats Data Query System (accessed in June 2006), UNESCO Statistical Yearbooks and Statistical Appendix, except for the following data: Algeria 1995: Ministry of National Education, Ministry of Finance, and National Office for Statistics through Banque Mondiale 2005; Egypt 1990: Ministry of Finance through World Bank 2002b; 1995–1999: Ministry of Finance, Egypt; Lebanon 1998: UNDP 2003. Yemen 1997–1999: Ministry of Finance.

**Note:** When data are not available in a given year, we used the year closest to that year. Averages are based on data for more than four points, except for the following data: Bahrain 1995–2003: average of 1995, 1996, and 1997. Libya 1975–1984: average of 1975, 1980, and 1984. Syrian Arab Rep. 1995–2003: average of 1995, 1996, and 1997. Yemen 1985–1994: average of 1993 and 1994.

enrollment at the secondary school level by almost threefold between 1970 and 2003; the number was approximately fivefold at the level of

TABLE 1.2

### Public Expenditure per Student by Level of Education and Ratio of Expenditure for Secondary/Primary and Tertiary/Primary, 2000

(PPP Constant 2000 International \$<sup>a</sup>)

	Primary spending/pupil 1980	Primary spending/pupil 2002	Secondary spending/pupil 2002	Secondary/primary 2002	Tertiary spending/student 2002	Tertiary/secondary 2002
Algeria	493	628	952	1.52	—	—
Bahrain	—	2,620	2,931	1.12	—	—
Iran, Islamic Rep. of	793	738	770	1.04	2,135	2.77
Jordan	—	596	705	1.18	—	—
Kuwait	2,935	2,709	3,336	1.23	—	—
Morocco	436	714	1,831	2.56	3,442	1.88
Oman	—	1,766	2,765	1.57	7,248	2.62
Saudi Arabia	4,278	3,817	3,749	0.98	—	—
Syrian Arab. Rep.	222	477	883	1.85	—	—
Tunisia	482	1,000	1,530	1.53	4,065	2.66
<b>Mean</b>	<b>1,377</b>	<b>1,506</b>	<b>1,945</b>	<b>1.46</b>	<b>4,222</b>	<b>2.48</b>
Indonesia	—	89	173	1.94	480	2.77
Korea, Rep. of	483	2,882	4,173	1.45	885	0.21
Malaysia	486	1,778	2,500	1.41	9,036	3.61
Philippines	241	446	368	0.83	582	1.58
Thailand	219	1,027	728	0.71	2,048	2.81
<b>Mean</b>	<b>357</b>	<b>1,245</b>	<b>1,589</b>	<b>1.27</b>	<b>2,606</b>	<b>2.20</b>
Argentina	745	1,164	1,593	1.37	1,393	0.87
Brazil	592	832	829	1.00	3,779	4.56
Chile	444	1,504	1,480	0.98	1,687	1.14
Colombia	259	1,077	1,106	1.03	1,881	1.70
Mexico	341	1,264	1,420	1.12	4,379	3.08
Peru	383	305	419	1.37	674	1.61
Uruguay	684	585	670	1.15	1,409	2.10
<b>Mean</b>	<b>493</b>	<b>962</b>	<b>1,074</b>	<b>1.15</b>	<b>2,172</b>	<b>2.15</b>

Sources: 2003b, World Bank WDI central database (accessed in June 2006) and UNESCO Institute for Statistics *Statistical Yearbooks*.

Note: When data are not available in a given year, we used the year closest to that year.

a. The international dollar is a hypothetical unit of currency that has the same purchasing power that the U.S. dollar has in the United States at a given point in time, i.e., it means the U.S. dollar converted at purchasing power parity (PPP) exchange rates.

higher education.<sup>4</sup> Despite this impressive progress, the average level of education among the population is still lower in MENA than in the comparator areas. Admittedly, the region started from a lower base than that found in the countries in East Asia and Latin America. But the fact remains that the average gross enrollment rate in secondary schools in MENA in 2003 was 75 percent, compared to 78 and 90 percent for East Asia and Latin America, respectively. Similarly, the average gross enroll-

TABLE 1.3

### Access to Primary School Education: Net Enrollment Rate, Repetition Rate, and Pupils Reaching Grade Five, 1970–2003

(percent)

	1970			1985			2003		
	NER	Repetition	Grade 5	NER	Repetition	Grade 5	NER	Repetition	Grade 5
Algeria	76.6	12.5	85.5	86.0	7.5	93.6	97.1	11.8	94.4
Bahrain	70.6	—	—	96.2	8.6	86.5	96.8	3.2	99.9
Djibouti	—	10.7	81.5	31.3	12.5	91.6	32.9	10.4	—
Egypt, Arab Rep. of	62.8	4.5	80.6	83.7	1.5	97.4	98.3	4.0	98.6
Iran, Islamic Rep. of	60.0	9.1	—	80.9	10.2	83.2	98.5	2.3	87.8
Iraq	55.4	20.6	73.7	93.1	20.8	84.0	87.7	8.0	—
Jordan	78.6	4.1	78.9	94.1	5.4	91.2	101.1	0.5	98.8
Kuwait	60.6	15.6	—	86.7	5.2	—	86.0	2.5	—
Lebanon	—	—	—	77.8	—	—	93.2	10.1	97.6
Libya	85.7	25.8	90.7	96.1	—	—	—	—	—
Morocco	39.1	29.8	65.8	60.7	19.8	68.9	92.0	13.8	75.6
Oman	27.1	9.3	74.0	66.4	11.7	93.5	77.9	0.8	97.6
Qatar	71.9	23.7	96.7	91.1	10.7	98.8	89.8	—	—
Saudi Arabia	32.4	15.2	82.6	50.9	12.4	93.3	53.1	4.2	93.6
Syrian Arab Rep.	69.5	10.9	88.9	94.7	7.5	95.5	98.1	7.5	—
Tunisia	75.6	29.2	67.8	93.1	20.4	86.6	97.2	9.2	96.5
United Arab Emirates	—	15.2	99.7	76.5	5.7	87.9	71.2	2.2	94.7
West Bank and Gaza	—	—	—	—	—	—	86.3	0.2	—
Yemen, Rep. of	—	—	—	51.7	—	—	66.8	5.5	67.3
<b>Mean</b>	<b>61.8</b>	<b>15.8</b>	<b>82.0</b>	<b>78.4</b>	<b>10.7</b>	<b>89.4</b>	<b>84.7</b>	<b>5.6</b>	<b>91.9</b>
China	—	10.0	—	97.4	6.1	86.0	95.0	0.3	99.9
Indonesia	72.4	10.7	59.7	97.2	10.9	84.6	94.3	2.9	92.1
Korea, Rep. of	94.5	0.1	96.3	94.5	—	99.2	99.6	0.2	99.9
Malaysia	88.1	0.0	—	93.7	0.0	98.2	93.2	0.0	98.4
Philippine	96.6	2.4	77.0	96.2	1.8	78.9	94.0	2.2	75.3
Thailand	—	10.3	48.7	75.9	8.3	—	85.8	4.0	—
<b>Mean</b>	<b>66.6</b>	<b>5.6</b>	<b>70.4</b>	<b>92.5</b>	<b>5.4</b>	<b>89.4</b>	<b>93.6</b>	<b>1.6</b>	<b>93.1</b>
Argentina	94.8	11.3	75.2	—	—	—	98.8	6.4	84.3
Brazil	69.8	19.2	27.6	81.2	19.8	37.0	92.9	20.6	—
Chile	90.2	10.4	81.7	87.7	—	—	86.0	2.4	99.0
Mexico	82.6	11.1	68.0	99.6	9.9	76.8	97.8	4.8	92.6
Peru	77.7	17.0	71.0	95.9	14.1	76.0	97.1	7.6	89.7
<b>Mean</b>	<b>83.0</b>	<b>13.8</b>	<b>64.8</b>	<b>91.1</b>	<b>14.6</b>	<b>63.2</b>	<b>94.5</b>	<b>8.4</b>	<b>91.4</b>

Sources: Statistical Appendix and UNESCO Institute for Statistics through World Bank EdStats Data Query System (accessed in June 2006).

Note: When data are not available for a given year, we used data for the year closest to that year. Djibouti: repetition rate in 2003 is only for public schools. West Bank and Gaza: net enrollment rate (NER) is for basic education (from grades 1 to 10).

ment rate in higher education in MENA was only 26.0 percent in 2003, which is about two-thirds of the average for the other two regions. These differences indicate that the level of human capital in MENA is still relatively low.

Moreover, there seems to be a big difference in the path taken by the MENA region in expanding the average level of education among the population compared with the approaches used in East Asia and Latin America. In MENA, expansion was not always through progressive universalization of primary schooling, followed by secondary and then higher education. Nor was it often in response to growing demand and the emergence of new and dynamic sectors. In the Arab Republic of Egypt, for example, the expansion of secondary and higher education was ahead of full enrollment at the lower levels of education. In the majority of MENA countries, expansion took place without a corresponding increase in new job opportunities in the more dynamic sectors of the economy.

The combination of free education at the secondary and higher levels and a policy of guaranteed employment in the public sector has had negative side effects: a demand for higher education that does not correspond to real economic needs and a lowering of demand for technical education because of the nontechnical nature of guaranteed jobs in government.

In contrast to the pattern of expansion observed in the MENA region, the growth of secondary and especially higher education in East Asia, except for the Philippines, has primarily been in response to new and dynamic industrial-sector needs in terms of skilled labor. For example, in China, since 2001, university enrollment has been expanded to nearly 20 percent of the age cohort, following a long period of high growth. Similarly, the Republic of Korea's higher education system did not begin to grow until after almost 15 years of rapid economic growth, and it was mainly supported with private funding.

In Latin America, the expansion of education has had some connection to the demand for labor. In the 1980s, secondary and higher education expanded rapidly, despite the debt crisis, economic recession, and relatively high unemployment. Enrollment at both levels continued to increase in the 1990s, a period of much higher growth. Within Latin America, the expansion of secondary and higher education was in response to demand in Brazil, Chile, Colombia, and Mexico, but was far ahead of economic needs in other countries, such as Peru. In fact, in Brazil and Mexico, university expansion seems to be lagging behind economic needs (Carnoy 2001).

### **Years of Schooling in the Adult Population**

Increased enrollment is expected to increase the average years of schooling over time. By this measure, which is frequently used in growth regressions as a proxy for investment in human capital, the data show that

TABLE 1.4

## Gross Enrollment Rates in Secondary and Tertiary Education, 1970–2003

(percent)

	1970		1985		2003	
	Secondary	Tertiary	Secondary	Tertiary	Secondary	Tertiary
Algeria	11.2	1.8	51.4	7.9	80.7	19.6
Bahrain	51.3	1.4	97.2	12.8	98.8	34.4
Djibouti	6.6	—	11.7	—	21.5	1.6
Egypt, Arab Rep. of	28.4	6.9	61.4	18.1	87.1	32.6
Iran, Islamic Rep. of	27.1	2.9	45.0	4.6	81.9	22.5
Iraq	24.4	4.8	53.8	11.5	42.0	15.4
Jordan	32.8	2.1	52.2	13.1	87.4	39.3
Kuwait	63.5	4.0	90.9	16.6	89.9	22.3
Lebanon	41.5	21.0	60.6	27.8	88.7	47.6
Libya	20.8	2.9	58.8	9.2	103.9	56.2
Morocco	12.6	1.4	35.4	8.7	47.6	10.6
Oman	0	—	26.5	0.8	86.4	12.9
Qatar	36.3	4.5	82.3	20.7	96.8	19.1
Saudi Arabia	12.1	1.6	40.1	10.6	67.8	27.7
Syrian Arab. Rep.	38.1	8.3	58.2	17.1	63.2	—
Tunisia	22.7	2.6	38.9	5.5	81.3	28.6
United Arab Emirates	21.8	—	54.7	6.8	66.5	22.5
West Bank and Gaza	—	—	—	—	93.6	37.9
Yemen, Rep. of	—	—	—	—	45.9	13.2
<b>Mean</b>	<b>26.5</b>	<b>4.7</b>	<b>54.1</b>	<b>12.0</b>	<b>75.3</b>	<b>25.8</b>
China	24.3	0.1	39.7	2.9	72.5	19.1
Indonesia	16.1	2.5	41.3	—	64.1	16.7
Korea, Rep. of	41.6	7.4	91.7	34.1	90.9	88.5
Malaysia	34.2	—	53.0	5.9	75.8	32.4
Philippines	45.8	16.8	64.4	24.9	85.9	28.8
Thailand	17.4	3.1	30.5	19.0	77.3	41.0
<b>Mean</b>	<b>29.9</b>	<b>6.0</b>	<b>53.4</b>	<b>17.3</b>	<b>77.8</b>	<b>37.7</b>
Argentina	44.4	13.4	70.2	35.7	86.4	63.9
Brazil	25.9	4.7	35.4	11.3	102.0	22.3
Chile	37.4	9.1	66.9	15.6	89.2	43.0
Mexico	22.5	5.4	56.5	15.9	79.7	23.4
Peru	30.7	10.5	62.8	22.4	91.7	33.4
<b>Mean</b>	<b>32.2</b>	<b>8.6</b>	<b>58.4</b>	<b>20.2</b>	<b>89.8</b>	<b>37.2</b>

Sources: Statistical Appendix and UNESCO Institute for Statistics through World Bank EdStats Data Query System (accessed in June 2006).

Note: When data are not available for a given year, we used the year closest to that year. Libya: Secondary and tertiary gross enrollment rates (GERs) in 2003 are from 2002. United Arab Emirates: Tertiary 2003 data are from 2002. Qatar: Tertiary 1970 data are from 1975. Brazil: Tertiary 1985 data are from 1990.

between 1960 and 2000, the average number of years of education in the adult population (15 years old and over) in the MENA region grew more rapidly than in other regions of the world (see table 1.5). However, by 2000, the region averaged 5.4 years of school attainment, compared to 7.3 and 7.2 years for East Asia and Latin America, respectively. The main

TABLE 1.5

### Average Years of Schooling of the Total Population Aged 15 and Over, 1960–2000

	1960	1980	2000
Algeria	0.98	2.68	5.37
Bahrain	1.04	3.62	6.11
Djibouti	—	—	—
Egypt, Arab Rep. of	—	2.34	5.51
Iran, Islamic Rep. of	0.80	2.82	5.31
Iraq	0.29	2.66	3.95
Jordan	2.33	4.28	6.91
Kuwait	2.89	4.53	7.05
Lebanon	—	—	—
Libya	0.97	3.87	—
Morocco	—	—	—
Oman	—	—	—
Qatar	—	—	—
Saudi Arabia	—	—	—
Syrian Arab. Rep.	1.35	3.65	5.77
Tunisia	0.61	2.94	5.02
United Arab Emirates	—	2.87	—
West Bank and Gaza	—	—	—
Yemen, Rep. of	—	0.34	2.91
<b>Mean</b>	<b>1.25</b>	<b>3.05</b>	<b>5.39</b>
Korea, Rep. of	4.25	7.91	10.84
Indonesia	1.55	3.67	4.99
Malaysia	2.88	5.09	6.80
Thailand	4.30	4.43	6.50
Philippine	4.24	6.51	8.21
China	—	4.76	6.35
<b>Mean</b>	<b>3.44</b>	<b>5.40</b>	<b>7.28</b>
Argentina	5.25	7.03	8.83
Brazil	2.85	3.11	4.88
Chile	5.21	6.42	7.55
Mexico	2.76	4.77	7.23
Peru	3.30	6.11	7.58
<b>Mean</b>	<b>3.87</b>	<b>5.49</b>	<b>7.21</b>

Sources: Statistical Appendix and Barro-Lee 2000.

Note: When data are not available in a given year, we used the year closest to that year. Libya: AYS in 1960 are from 1965, and 1980 from 1985. United Arab Emirates: AYS in 1980 are from 1975. Yemen: AYS in 2000 are from 1999. AYS in 1980 for Yemen are for Yemen, N. Arab.

problem for MENA countries, then, is not the growth of the average years of schooling; rather, it is the extremely low initial level of education in most countries in the 1960s and 1970s.

Thus, in 1960, Jordan's adult population had an average of only 2.33 years of schooling, which is lower than the level in every East Asian and

Latin American country on our list except Indonesia. By 2000, Jordan's population had higher average education levels (6.91 years) than Indonesia, Malaysia, Thailand, China, and Brazil—most of which had started in 1960 with higher levels of education than Jordan. The gap between other MENA countries for which we have data and East Asia and Latin America has also been reduced. Even so, the average level of education in MENA in 2000 is still less than it is in East Asia and Latin America by more than one full year.

The number of years of schooling is a popular but inaccurate measure of human capital investment, however, because it assumes that the quality of each year of schooling in each country is the same. It assumes that most countries teach approximately the same academic skills in various grades of primary, lower secondary, and upper secondary schools. These assumptions clearly do not hold, and need to be corrected by one measure of quality or another; this is the subject we turn to next.

## Investment in Education and the Quality of Human Capital

Measuring the quality of education is illusive, and can only be approximated by using different indicators. In this section, three such indicators are used: scores on international tests, fields of study in higher education, and literacy rates. Imperfect as these indicators may be, they provide a reasonable “weight” that can be attached to the number of years of schooling in the labor force as an improved measure of human capital investment.

### Quality of Secondary Education

A large number of countries in the MENA region, in East Asia, and in Latin America have now participated in one or more international tests of eighth graders (Trends in International Math and Science Study—TIMSS) or 15-year-olds (Programme for International Student Assessment—PISA). The results on these tests capture the relative amount of language and math learned by those who are reaching the end of lower secondary school.

Table 1.6 shows the average math scores for 21 countries in the MENA, East Asian, and Latin American regions.<sup>5</sup> The results indicate that the average of 401 for the MENA region is modestly below that of Latin American countries (406) but significantly below that of East Asia (466). More broadly, the MENA region scores below the international average of 489,<sup>6</sup> let alone the top performing country, Singapore, whose average score for TIMSS 1995, 1999, and 2003 is 617.

Within the region, the Islamic Republic of Iran, Lebanon, and Jordan score above the regional average, while Saudi Arabia and Morocco are below the average.

Usually, test scores are adjusted by GDP per capita and gross enrollment rates in secondary schools to take into account the possible effect of higher social class on student performance. Higher GDP/capita is typically associated with a higher average level of family education and resources, and lower gross enrollment rates in secondary school indicate that the education system is more elitist and selective, thus probably contributing to higher test scores. Thus, we would expect to find a positive relationship between test scores and GDP/capita and a negative relationship between test scores and gross enrollment rates.

We estimate such an equation, using the indicators provided in table 1.6 and leaving out the three Gulf States (Bahrain, Kuwait, and Saudi Arabia) because their very high GDP per capita and low scores are not representative of the typical relationship between these two variables. The estimated equation is as follows:

$$\text{Test score} = 351.44 + 0.0116 \text{ GDP/cap} - 0.1163 \text{ GrossSecEnr} + \varepsilon; R^2 = 0.47 \quad (1)$$

(3.78)                      (-0.15)

The figures in parentheses are the t-values, showing that the estimated coefficient for GDP/capita is significant at the 1 percent level, and the coefficient for gross secondary enrollment is not significantly different from zero, although it has the expected negative sign.

Using this equation, we can predict the test score each country should have if the students do as well as those in other countries of the world that have the same GDP/capita and gross secondary enrollment rates. Table 1.7 ranks the 18 countries in our sample by test score, then uses equation (1) to estimate the predicted value of the test score based on the country's values of the two independent variables. The difference between the actual and the predicted value is the "residual," or the unexplained part of the test score. A positive residual indicates that students in that country do better than GDP/capita and gross enrollment would predict; a negative score indicates the opposite.

It is interesting to note that when we adjust for their GDP/capita and gross secondary enrollment rates, Jordan, Lebanon, and Egypt move down the rank order relative to their rank order in the absolute score. Morocco moves up the rank order. Iran and Tunisia remain essentially at about the level predicted. If the test scores reflect the quality of education systems, as opposed to some other socioeconomic variables we have not accounted for, this implies that MENA's education systems may be

TABLE 1.6

### Average Test Scores of TIMSS and PISA, GDP/Capita (2003), and Gross Secondary Enrollment Rate

(percent, 2000)

	Test taken	Approximate average test score	GDP/capita 2003	Secondary gross enrollment 2000
Bahrain	TIMSS 2003	401	17,212	96
Egypt, Arab Rep. of	TIMSS 2003	406	3,731	86
Iran, Islamic Rep. of	TIMSS 95/99/03	420	6,608	77
Jordan	TIMSS 99/03	426	4,081	87
Kuwait	TIMSS 95	392	17,049	89
Lebanon	TIMSS 03	433	4,793	80
Morocco	TIMSS 99/03	362	3,783	40
Saudi Arabia	TIMSS 2003	332	12,495	72
Tunisia	TIMSS 99/03, PISA 03	420	6,765	77
<b>Mean</b>		<b>399</b>	<b>8,502</b>	<b>78</b>
Indonesia	TIMSS 99/03, PISA 2000/03	409	3,175	57
Korea, Rep. of	TIMSS 95/99/03, PISA 2000/03	574	16,977	94
Malaysia	TIMSS 99/03	514	8,986	70
Philippines	TIMSS 99/03	362	4,082	77
Thailand	TIMSS 95/99, PISA 2900/03	478	7,175	82
<b>Mean</b>		<b>467</b>	<b>8,079</b>	<b>76</b>
Argentina	PISA 2000	430	11,436	97
Brazil	PISA 2000/03	398	7,360	108
Chile	TIMSS 99/03, PISA 2000	404	9,706	75
Colombia	TIMSS 95	385	6,331	70
Mexico	PISA 2000/03	429	8,661	75
Peru	PISA 2000	358	4,969	81
Uruguay	PISA 03	453	7,822	98
<b>Mean</b>		<b>408</b>	<b>8,041</b>	<b>86.3</b>
International average	TIMSS 95/99/03	489		
Top performing countries	TIMSS 95/99/03	617		

**Sources:** TIMSS: <http://timss.bc.edu/>. PISA: <http://www.pisa.oecd.org>. GDP per capita PPP (constant 2000 international \$): World Bank 2005. Secondary Gross Enrollment Rate: Statistical Appendix.

**Note:** TIMSS is conducted by IEA (International Association for the Evaluation of Educational Achievement). PISA is conducted by OECD (Organisation for Economic Co-operation and Development).

functioning satisfactorily in some countries given their level of economic development, whereas those in other countries fall below this average. In that sense, at the lower secondary level at least, the quality of human capital in some of the MENA countries may also be acceptable.

If we include the three Gulf States for which we have test score data—Bahrain, Kuwait, and Saudi Arabia—this picture changes. The estimated regression line of test scores on GDP/capita and gross secondary enrollment is essentially flat, and the coefficients of GDP/capita and gross secondary enrollment are not significantly different from zero. One reason

TABLE 1.7

**Test Scores of TIMSS and PISA Unadjusted, and Adjusted for GDP/Capita Ordered by Residuals**

	Test score		Predicted test score <sup>a</sup>	Residual
Korea, Rep. of	574	Malaysia	448	66
Malaysia	514	Thailand	425	53
Thailand	478	Korea, Rep. of	537	37
Uruguay	453	Jordan	389	37
Lebanon	433	Lebanon	398	35
Argentina	430	Indonesia	382	27
Mexico	429	Uruguay	431	22
Jordan	426	Egypt, Arab Rep. of	385	21
Iran, Islamic Rep. of	420	Iran, Islamic Rep. of	419	1
Tunisia	420	Tunisia	421	-1
Indonesia	409	Mexico	443	-14
Egypt, Arab Rep. of	406	Brazil	424	-26
Chile	404	Philippines	390	-28
Brazil	398	Morocco	391	-29
Colombia	385	Colombia	417	-32
Morocco	362	Peru	400	-42
Philippines	362	Argentina	473	-43
Peru	358	Chile	455	-51

**Note:** Based on regression estimate of test score run on GDP/capita in 2003 and gross secondary enrollment rate, 2000.

for this is that the very high GDP/capita in the three oil states reflects wealth per inhabitant, but it is not the kind of wealth based on higher education and social capital associated with children's higher academic performance in school. Even after a generation of high income from petroleum exports, apparently the academic level in these countries remains low.

### Field of Study by Higher Education Students

The proportion of enrollment in university in science and engineering versus humanities and social sciences could be viewed as another index of the "quality" of human capital at the level of higher education. The underlying assumption here is that scientists and engineers are likely to contribute more to economic growth than are social scientists and students of humanity because of the increasing importance of technological innovation and adaptation in the development process.<sup>7</sup> If this assumption holds, it is instructive to look at the data in table 1.8, which indicate that MENA countries have a high percentage of their university students studying humanities and social sciences. In more than half of the MENA countries, about two-thirds of the students major in those fields. This pattern of enrollment is the opposite of what we observe in East Asia and, to a lesser extent, in Latin America.

TABLE 1.8

**Distribution of University Students by Field of Study**

(percent, most recent year)

		Education and humanities	Social sciences	Medicine	Scientific, technical, and Engineering	Others
Algeria	2003	16.4	38.2	7.1	18.0	20.2
Bahrain	2002	10.0	50.0	7.0	21.0	12.0
Djibouti	2003	20.0	51.0	0.0	22.0	7.0
Egypt, Arab Rep. Of	1995	35.0	41.2	7.4	10.2	6.1
Iran, Islamic Rep. Of	2003	17.6	27.5	7.3	38.2	9.3
Iraq	2003	30.8	21.3	8.1	24.1	15.8
Jordan	2002	30.0	26.0	10.0	30.0	4.0
Lebanon	2003	21.2	38.8	8.5	25.7	5.8
Libya	1999	30.3	18.3	17.0	30.8	3.6
Morocco	2003	27.6	47.8	3.9	18.3	2.3
Oman	2003	54.2	21.1	2.8	14.0	7.9
Qatar	2003	19.1	48.3	3.9	19.1	9.5
Saudi Arabia	2003	60.7	15.1	4.6	13.6	6.1
Syrian Arab Rep.	1994	29.2	28.2	11.5	25.3	5.8
Tunisia	2002	22.0	27.0	7.0	31.0	13.0
United Arab Emirates	1996	57.8	13.6	1.7	24.1	2.8
West Bank and Gaza	2003	42.4	33.4	5.6	18.1	0.4
<b>Mean</b>		<b>30.8</b>	<b>32.2</b>	<b>6.7</b>	<b>22.6</b>	<b>7.7</b>
China	1994	22.8	9.4	8.9	46.8	12.1
Indonesia	1995	21.3	54.9	2.1	15.1	6.7
Korea, Rep. Of	2002	23.4	20.4	7.3	41.1	7.9
Malaysia	2002	20.0	27.0	4.0	40.0	11.2
Philippine	2002	20.0	31.0	9.0	24.0	16.0
Thailand	1995	12.2	59.7	5.9	17.6	4.7
<b>Mean</b>		<b>19.9</b>	<b>33.7</b>	<b>6.2</b>	<b>30.8</b>	<b>9.8</b>
Argentina	2002	10.0	35.0	10.0	14.0	31.0
Bolivia	2000	26.0	33.0	17.0	16.0	8.0
Brazil	1994	20.5	44.0	9.3	20.1	6.1
Chile	2002	20.0	35.0	9.0	32.0	5.0
Colombia	1996	17.1	43.2	9.1	28.5	2.2
Mexico	2002	15.0	42.0	8.0	32.0	4.3
Peru	1991	13.0	42.1	11.4	24.3	9.2
<b>Mean</b>		<b>17.4</b>	<b>39.2</b>	<b>10.5</b>	<b>23.8</b>	<b>9.4</b>

Sources: UNESCO Statistical Yearbook 1998 and UNESCO Institute for Statistics, Data Centre (accessed on June 2006).

The modest level of student enrollment in science and technology at the level of higher education in some MENA countries is due in part to government restrictions on access to these faculties, as in Morocco and Egypt, for example. In contrast, not as many restrictions are imposed on enrollment in the social sciences and humanities. In Djibouti, Egypt, Morocco, Oman, Saudi Arabia, the United Arab Emirates, and West

Bank and Gaza, more than 70 percent of the students are in the humanities and social sciences. This pattern of enrollment is historically consistent with a policy of absorbing most university graduates into civil service jobs, but is ill suited to a development strategy that draws on private initiatives and dynamic manufacturing and service sectors.

### **Illiteracy Rates**

A third dimension of the quality of human capital is literacy rates among the adult population. By this measure, table 1.9 indicates that, despite the rapid growth of enrollment in primary schools in MENA in the past 20 years, a high fraction of the adult population (one in five adults in 2003) is still illiterate. The level of illiteracy in the adult population, especially among women, sharply distinguishes most MENA countries from most Latin American and East Asian societies. In two countries—Morocco and Yemen—about one-half the population remains illiterate. The total number of illiterates in MENA countries (54 million) represents about 1.5 percent of all the illiterate adults in the world. The 36 million illiterate women in MENA also represent about 2.2 percent of all illiterate women in the world.<sup>8</sup>

Female illiteracy has come down in the MENA region over time, and the rate of change has been rapid and steady. However, given the large gaps that persist between MENA and other comparators, full convergence is still a long way off. Whereas average female illiteracy rates are 30 percent for the MENA region, they are as low as 9 and 12 percent among comparator countries in Latin America and East Asia, respectively. As for the literacy gap between men and women, there is clear evidence of rapid equalization over time. While the ratio of literate females to literate males was only 0.60 in 1980, it had risen to almost 0.83 by 2003. Once again, the rate of progress was faster in MENA than among its comparators.

Several factors account for the gender gap in the MENA region. One factor is social, as the enrollment of boys in schools was historically favored over that of girls. Adult males may also have more learning opportunities to become literate in the workplace. In addition, because women tend to live longer than men, at any given time there are more women who grew up in times of low school coverage in the oldest age cohorts. However, most of the MENA countries have significantly reduced their illiteracy rate since 1980. This in turn has reduced the absolute difference between men and women from 26 percent to 15 percent. The problem of high female illiteracy will gradually be reduced in the MENA region thanks to increasing universal primary education for girls. Nevertheless, Algeria, Egypt, Morocco, and Yemen still have a long way to go in reducing female illiteracy.

TABLE 1.9

**Illiteracy Rates of the Population Aged 15 and over by Gender, 1980–2000/04**

(percent)

	Illiteracy rate 1980			Illiteracy rate 2003		
	Total	Males	Females	Total	Males	Females
Algeria	63.4	50.5	75.5	30.1	20.4	39.9
Bahrain	28.8	21.6	40.7	13.5	11.5	16.4
Djibouti	—	—	—	—	—	—
Egypt, Arab Rep. of	60.7	46.3	75.3	28.6	17.0	40.6
Iran, Islamic Rep. of	50.3	39.1	61.8	23.0	16.5	29.6
Iraq	—	—	—	26.0	15.9	35.8
Jordan	30.8	17.8	44.6	9.7	4.9	15.3
Kuwait	32.2	27.0	40.6	6.7	5.6	9.0
Lebanon	—	—	—	—	—	—
Libya	47.3	28.8	69.5	18.3	8.2	29.3
Morocco	71.4	57.9	84.5	47.7	34.3	60.4
Oman	63.8	48.6	83.7	18.7	13.2	26.5
Qatar	30.2	28.2	34.6	11.0	10.9	11.4
Saudi Arabia	49.2	35.0	67.7	20.7	12.9	30.7
Syrian Arab Rep.	46.7	27.8	66.2	20.4	14.0	26.4
Tunisia	55.1	41.6	68.8	25.7	16.6	34.7
United Arab Emirates	34.6	32.6	41.0	22.7	24.4	19.3
West Bank and Gaza	—	—	—	8.1	3.3	12.6
Yemen, Rep. of	80.0	61.8	94.5	51.0	30.5	71.5
<b>Mean</b>	<b>49.6</b>	<b>37.6</b>	<b>63.7</b>	<b>22.5</b>	<b>15.3</b>	<b>30.0</b>
China	32.9	21.0	45.7	9.1	4.9	13.5
Indonesia	31.0	20.9	40.6	9.6	6.0	13.2
Korea, Rep. of	—	—	—	—	—	—
Malaysia	28.8	20.0	37.7	11.3	8.0	14.7
Philippines	12.2	11.2	13.2	7.4	7.5	7.4
Thailand	12.5	7.5	17.4	7.4	5.1	9.5
<b>Mean</b>	<b>23.5</b>	<b>16.1</b>	<b>30.9</b>	<b>9.0</b>	<b>6.3</b>	<b>11.6</b>
Argentina	5.6	5.3	6.0	2.8	2.8	2.8
Brazil	24.0	22.0	25.9	11.4	11.6	11.2
Chile	8.6	7.7	9.5	4.3	4.2	4.4
Mexico	18.7	13.7	23.5	9.1	7.6	10.4
Peru	20.6	11.7	29.4	12.3	6.5	17.9
<b>Mean</b>	<b>15.5</b>	<b>12.1</b>	<b>18.9</b>	<b>8.0</b>	<b>6.5</b>	<b>9.3</b>

Source: Statistical Appendix and UNESCO Institute of Statistics (through WB EdStats).

Note: When data were not available for a given year, the data for a year close to that year were used.

## Investment in Education and the Distribution of Human Capital

While enrollment and quality of education may increase, access to education can remain limited to high-income groups, to those who live in urban areas, or to boys at the expense of girls. This would lead to un-

equal distribution of human capital, eroding its potential as a mechanism for reducing poverty and enhancing economic growth. The issue addressed in this section is whether or not the region's education strategies favored a more egalitarian distribution of human capital over time. The answer is ambiguous at best; inclusion policies may have diminished over time while gender parity efforts proved effective.

### **Inclusion Policies**

In addition to the high level of public spending and the expansion of enrollment, wide access to education has been assured in most MENA countries through a policy of free education for all that was enacted mostly in the 1950s and 1960s. This policy was generally applied at all levels of education, from basic to tertiary. Education was considered by many countries as a right; this was especially true in the Maghreb countries, Egypt and Syria. As a result of these policies, the region had achieved more equality in the distribution of education in 1970 than had our sample of countries from East Asia and Latin America. As shown in table 1.10, the data indicate that the standard deviation from the mean of years of education in the adult population (15 years of age or older) was only 3.4 in the MENA region, whereas the corresponding standard deviations for Latin America and East Asia were 3.64 and 3.77, respectively.<sup>9</sup> Between 1985 and 2000, however, both the MENA and non-MENA countries exhibited rising standard deviations from the mean of years of schooling in the adult population. Yet this trend was so strong in the MENA region that the average dispersion of education became more skewed than in the other two regions.

Increasing education inequality in MENA is further supported by additional data on the percentage of enrollment by poor versus nonpoor and rural versus urban populations in primary and secondary education for a sample of countries. The data, shown in table 1.11, are derived from household surveys in the second half of the 1990s. These data are available for only six MENA countries and over time only for Egypt and Morocco. Nevertheless, they reveal that, despite good intentions, the nonpoor and students who live in urban areas tend to have higher access to education at both levels than the poor and those who live in rural areas. The only exceptions are Algeria and Iran, where the data show almost equal access by both groups across geographical locations for primary education.

Why did MENA countries move from a situation of somewhat equal distribution of education to a situation in which distribution has become more skewed over time? The answer can be traced to a number of factors, some of which are structural in nature while others are policy

TABLE 1.10

**Distribution of Education, 1970–2000**

(standard deviation from the average years of schooling of the population aged 15 and above)

	1970	1975	1980	1985	1990	1995	2000
Algeria	3.11	3.46	3.89	4.38	4.78	4.95	5.03
Egypt, Arab Rep. of	—	3.42	4.24	4.67	5.00	5.13	5.24
Iran, Islamic Rep. of	3.43	3.92	4.28	4.49	4.66	4.90	5.08
Jordan	4.14	4.37	4.93	5.21	5.35	5.37	5.41
Morocco	—	—	—	—	—	—	—
Syrian Arab Rep.	3.23	3.84	4.32	4.65	4.80	4.76	4.77
Tunisia	3.09	3.93	4.34	4.65	4.82	5.01	5.15
Yemen, Rep. of	—	0.90	1.55	2.55	3.29	—	—
<b>Mean</b>	<b>3.40</b>	<b>3.41</b>	<b>3.94</b>	<b>4.37</b>	<b>4.67</b>	<b>5.02</b>	<b>5.11</b>
Korea, Rep. of	4.53	4.55	4.68	4.42	4.03	4.04	4.03
Malaysia	4.00	4.18	4.30	4.44	4.49	4.51	4.55
Philippines	3.81	3.83	3.94	3.93	3.78	3.84	3.71
Thailand	3.30	3.39	3.62	4.01	4.29	4.53	4.71
Indonesia	3.22	3.34	3.47	3.29	4.33	4.45	4.53
China	—	4.43	4.36	4.37	4.36	4.36	4.34
<b>Mean</b>	<b>3.77</b>	<b>3.95</b>	<b>4.06</b>	<b>4.08</b>	<b>4.21</b>	<b>4.29</b>	<b>4.31</b>
Argentina	3.54	3.78	3.72	4.02	3.94	4.04	4.14
Brazil	3.55	3.22	3.41	3.56	3.65	3.73	3.87
Chile	4.04	4.15	4.35	4.43	4.56	4.76	4.90
Colombia	3.04	3.65	3.81	3.95	4.17	4.35	4.50
Mexico	3.67	3.80	4.40	4.51	4.62	4.65	4.64
Peru	4.04	4.07	4.41	4.48	4.58	4.67	4.74
Uruguay	3.98	3.86	4.00	4.05	4.26	4.40	4.53
<b>Mean</b>	<b>3.69</b>	<b>3.79</b>	<b>4.01</b>	<b>4.14</b>	<b>4.25</b>	<b>4.37</b>	<b>4.47</b>

Source: Thomas, Wang, and Fan 2001.

driven. On the former front, standard deviations from the mean tend to increase over time as countries expand their educational systems because, as the average level of education increases from low levels, dispersion increases. Subsequently, as the average level of education reaches into upper secondary school, the dispersion levels off and eventually declines as a ceiling effect (i.e., university graduate education) cuts off the upper end of the distribution. Because MENA countries started from a lower level of school attainment and a more equitable distribution of educational attainment than countries in other regions, such a trend was almost inevitable. On the policy front, it has already been noted that the region allocated higher expenditures per pupil in secondary relative to basic education compared to East Asia and Latin America.

Some countries, like Egypt, also opted to expand secondary and high education before full enrollment in primary schools was completed, although this practice was an exception. Both policy decisions would have

TABLE 1.11

## Enrollment Rates for Poor and Nonpoor

(percent)

			Urban		Rural	
			Poor	Nonpoor	Poor	Nonpoor
Algeria	1995	primary	96.0	95.0	89.0	89.0
		secondary	77.0	82.0	59.0	66.0
Egypt, Arab Rep. of	1995	6–15	89.5	98.0	92.9	95.6
		15–19	66.0	83.9	67.2	74.7
	1999	6–15	95.8	98.5	93.5	96.7
		15–19	72.4	84.9	64.7	72.9
Iran, Islamic Rep. of	2001	6–10	99.0	100.0	98.0	98.0
		11–13	92.0	97.0	76.0	84.0
Morocco	1990	7–15	70.7	84.1	34.3	43.2
	1998	7–15	69.4	87.2	36.4	49.8
Tunisia	2000	6–18	79.4	82.2	67.0	70.7
Yemen, Rep. of	1998	10–14	83.0	92.1	59.6	62.0

**Sources:** Algeria: LSMS (ENMNV), ONS, and staff estimates cited in World Bank 1999; Egypt: World Bank 2002a; Iran: SECH Survey 2001 through World Bank 2006; Morocco: Statistical Office, 1990/91 and 1998/99 LSMS data through World Bank 2001; Tunisia: INS, based on HBCS 2000 through World Bank 2003a. Yemen: estimates based on 1998 HBCS through World Bank 2002c.

**Note:** Algeria: using upper general poverty line. Morocco: using higher poverty lines (2674 DH in urban and 2384 DH in rural areas). Tunisia: poor and economically vulnerable. Yemen: for the 10–14 age group. Information for the 5–9 age group is not available.

provided more benefit to families in higher social classes than to those at the bottom.

In addition to the factors described above, the region has increasingly relied on the private sector for the provision of education at different levels (table 1.12). While this trend may increase the inequity in the distribution of education, the outcome depends on the strategy adopted by government, especially in terms of the level of education left to the private sector and the nature of public funding. A strategy that relies on the private sector for the provision of education at higher levels with government commitment to providing basic education is likely to be more egalitarian than one that allows greater private sector involvement in basic education relative to higher education. Similarly, a strategy that commits public funding to poor students, even if they enroll in private schools, is likely to be more egalitarian than one that leaves full funding to households irrespective of their ability to pay. On both counts, the MENA region's strategy fares less well than the strategy adopted by the East Asian countries and, to a lesser extent, by the Latin American countries.

More concretely, the information provided in table 1.12 indicates that the MENA countries have allowed greater private participation in the provision of education at all levels over time, whereas other regions decreased their share of private education enrollment in secondary education. For basic education, the average enrollment rate increased from

TABLE 1.12

### Private Enrollment Share in Primary, Secondary, and Tertiary Education as a Percentage of Total Enrollment, 1980–2003

	Primary			Secondary			Tertiary		
	1980	1990	2003	1980	1990	2003	1980	1990	2003
Algeria	0	0	0	0	0	0	—	—	—
Bahrain	—	13.2	22.6	—	8.8	15.5	—	—	—
Djibouti	—	8.9	15.5	—	15.7	21.0	—	—	—
Egypt, Arab Rep. of	5.0	5.8	8.0	11.0	3.8	5.5	—	12.5	16.5
Iran, Islamic Rep. of	—	0.1	4.3	—	0.3	5.7	—	—	54.1
Iraq	—	—	—	—	—	—	—	—	6.5
Jordan	6.0	22.9	29.9	19.0	6.1	16.6	—	—	24.7
Kuwait	—	25.0	32.3	—	22.6	27.6	—	—	—
Lebanon	61.0	68.3	64.7	47.0	57.8	51.9	—	—	49.3
Libya	—	—	2.5	—	—	2.8	—	—	—
Morocco	3.0	3.6	5.5	5.0	2.7	4.6	—	1.5	5.1
Oman	—	1.8	—	—	0.7	1.1	—	—	28.7
Qatar	—	23.4	71.8	—	12.3	32.3	—	—	—
Saudi Arabia	3.0	4.1	6.9	20.0	2.8	7.3	—	—	7.4
Syrian Arab Rep.	5.0	3.6	4.2	7.0	5.6	4.1	—	—	—
Tunisia	1.0	0.5	1.0	7.0	12.0	3.9	—	—	0.4
United Arab Emirates	—	32.3	57.6	10.0	20.7	40.6	—	—	—
West Bank and Gaza	—	—	8.4	—	—	4.3	—	—	58.1
Yemen, Rep. of	—	—	1.8	—	—	1.7	—	—	8.7
<b>Mean</b>	<b>10.5</b>	<b>14.2</b>	<b>19.8</b>	<b>12.0</b>	<b>11.5</b>	<b>13.7</b>			<b>23.6</b>
China	0	—	—	0	—	—	—	—	—
Indonesia	21.0	17.6	16.3	49.0	49.2	42.9	—	—	65.2
Korea, Rep. of	1.0	1.4	1.3	46.0	45.2	35.9	—	—	80.6
Malaysia	—	0.3	0.94	—	6.2	5.3	—	—	32.7
Philippine	5.0	6.7	7.3	48.0	36.4	19.7	—	—	65.7
Thailand	8.0	9.6	15.2	13.0	16.2	10.4	—	—	18.5
<b>Mean</b>	<b>7.0</b>	<b>7.1</b>	<b>8.2</b>	<b>31.2</b>	<b>30.6</b>	<b>22.8</b>			<b>52.5</b>
Argentina	18.0	20.0	20.6	39.0	—	27.0	—	—	22.3
Brazil	13.0	14.2	9.9	—	34.8	12.3	—	—	70.3
Chile	20.0	38.8	50.2	24.0	49.0	51.2	—	—	75.3
Mexico	5.0	6.2	8.1	19.0	16.6	15.5	—	—	33.0
Peru	13.0	12.6	15.3	15.0	14.6	21.6	—	—	46.9
<b>Mean</b>	<b>13.8</b>	<b>18.4</b>	<b>20.8</b>	<b>24.3</b>	<b>28.8</b>	<b>25.5</b>			<b>49.6</b>

Sources: UNESCO Statistical Yearbooks, UNESCO Institute for Statistics through WB EdStats, Data Query System and Statistical Appendix.

Note: The following numbers are for the closest years. Egypt: secondary share 1990 is from 1991; Iran: secondary enrollment share 2003 is from 2002; Kuwait: secondary share 1990 is from 1991; Lebanon: primary and secondary shares 1990 are from 1991; Libya: primary and secondary shares 2003 are from 2002; Tunisia: tertiary share 2003 is from 2002. Argentina: primary and secondary shares 2003 are from 2002. Peru: tertiary share 2003 is from 2002.

10.5 percent in 1980 (primarily because of Lebanon) to an average of 19.8 percent in 2003 for most countries in the sample.<sup>10</sup> Changes at the secondary school level during the same period were much more modest, increasing slightly from 12.0 to 13.7 percent. As for tertiary education,

while the information is scant the available information suggests that only a few countries (Lebanon, Iran, and West Bank and Gaza) allowed a significant private sector involvement. A second main observation is that the average rate of enrollment in private schools in MENA in 2003 was higher at the basic level than it was in secondary education. In the same year, enrollment in tertiary education was only modestly higher (about 24 percent) than the average enrollment rate in secondary schools.

The above pattern stands in sharp contrast to that of East Asia and, to a lesser extent, Latin America. East Asia has essentially privatized higher levels of schooling and left primary education almost entirely in the public hands. The pattern of enrollment in private schools in 2003 was 8.2 percent in primary schools, 22.8 percent in secondary schools, and 52.5 percent in higher education. Except in China and Malaysia, a significant fraction of the cost of higher education in East Asia is borne by families. A similar pattern holds for Latin America, although with lower public commitment to primary education than in East Asia. Thus, from both regions, countries like Korea, China, Brazil, and Chile have significantly privatized their higher education systems, either by limiting space at free public universities so that expansion has to take place in fee-charging private universities (as in Korea and Brazil) or by charging high fees at public universities (as in Chile and China).<sup>11</sup> In that sense, private education is used as a strategy to mobilize private resources and also to socially stratify educational access.

### **Gender Parity**

Notwithstanding some growing inequality in the distribution of human capital in general, as noted above, the MENA region has made remarkable progress in the last 30 years with respect to closing the gender gap in education. Progress has been steady and rapid, covering all levels of education. As shown in tables 1.13 and 1.14, gender parity for basic education is almost complete. Although the region started with relatively low levels of gender parity, the parity indices for secondary and higher education are not significantly different from the corresponding indices for Latin America and East Asia. The area where more progress is still needed is in relation to illiteracy, which remains significant among the female adult population, as discussed in the section on education quality.

Progress has not been even across all countries, however. With respect to primary education, Djibouti and Yemen have yet to close the gender gap. At the level of secondary education, although few countries have attained full secondary enrollment, almost all have attained gender parity.

TABLE 1.13

### Gender Parity Index of Gross Intake Rate to Grade 1, Gross Enrollment Rate, and Repetition Rate in Primary Education

(female as a proportion of male)

	1970			1985			2003		
	GIR	GER	Repetition	GIR	GER	Repetition	GIR	GER	Repetition
Algeria	—	0.62	—	0.87	0.81	0.69	0.98	0.93	0.63
Bahrain	—	0.74	—	1.04	1.06	1.04	0.99	1.00	0.75
Djibouti	0.43	0.42	0.85	—	0.70	—	0.83	0.79	1.00
Egypt, Arab Rep. of	0.70	0.65	1.54	0.86	0.81	0.82	0.98	0.95	0.58
Iran, Islamic Rep. of	0.60	0.56	0.62	0.88	0.80	—	1.15	1.10	0.55
Iraq	0.46	0.43	1.07	0.94	0.85	0.85	0.94	0.82	0.72
Jordan	—	0.82	—	1.01	1.01	—	1.01	1.01	0.94
Kuwait	0.82	0.76	0.96	0.98	0.97	0.98	0.99	1.01	0.82
Lebanon	—	0.86	—	—	—	—	0.99	0.96	0.71
Libya	0.85	0.62	0.95	—	0.92	—	—	1.00	—
Morocco	—	0.55	—	—	0.64	0.87	0.95	0.90	0.74
Oman	—	0.16	—	0.99	0.80	0.7	1.02	1.00	0.64
Qatar	0.92	0.85	0.99	1.06	0.97	0.61	1.00	0.98	—
Saudi Arabia	—	0.47	—	0.85	0.78	0.58	1.00	0.96	0.66
Syrian Arab Rep.	0.73	0.62	0.85	0.93	0.88	0.82	0.97	0.95	0.79
Tunisia	—	0.66	—	0.94	0.85	0.88	1.01	1.00	0.67
United Arab Emirates	—	0.63	—	0.97	1.00	0.85	0.99	0.97	0.68
West Bank and Gaza	—	—	—	—	—	—	0.99	1.00	0.84
Yemen, Rep. of	—	—	—	—	—	—	0.77	0.73	0.83
<b>Mean</b>	<b>0.69</b>	<b>0.61</b>	<b>0.98</b>	<b>0.95</b>	<b>0.86</b>	<b>0.81</b>	<b>0.97</b>	<b>0.95</b>	<b>0.74</b>
China	—	—	—	—	—	—	0.98	1.00	0.76
Indonesia	—	0.83	—	—	0.86	—	0.96	0.98	1.00
Korea, Rep. of	1.00	0.99	0.88	1.02	0.94	—	1.00	0.99	—
Malaysia	—	0.89	—	1.01	1.02	—	1.00	1.00	—
Philippines	—	—	—	0.94	0.99	0.99	0.93	0.99	0.54
Thailand	—	0.91	—	—	0.99	—	0.93	0.96	1.03
<b>Mean</b>		<b>0.90</b>		<b>0.99</b>	<b>0.96</b>		<b>0.97</b>	<b>0.99</b>	<b>0.83</b>
Argentina	0.98	1.01	0.79	—	1.01	—	1.00	0.99	0.69
Brazil	—	1.00	—	—	—	—	0.92	0.94	0.96
Chile	1.00	1.00	0.83	—	0.97	—	0.98	0.95	0.62
Mexico	—	0.94	—	—	0.98	—	0.99	0.98	0.66
Peru	0.86	0.87	0.93	—	0.96	—	1.01	0.99	0.94
<b>Mean</b>	<b>0.95</b>	<b>0.96</b>	<b>0.85</b>		<b>0.98</b>		<b>0.98</b>	<b>0.97</b>	<b>0.77</b>

Sources: Statistical Appendix and UNESCO Institute of Statistics (through World Bank EdStats).

Note: Gross Intake Rate (GIR) to grade 1 is the total number of new entrants in the first grade of primary education, regardless of age, expressed as a percentage of the population of theoretical age to primary education.

Only Djibouti, Iraq, Morocco, and Yemen still have significant secondary education gender gaps. Furthermore, for Algeria, Bahrain, Jordan, Kuwait, Lebanon, Libya, Tunisia, the United Arab Emirates, and West Bank and Gaza, the gender gap at secondary levels is smaller than it is at primary levels. Gender parity rates for higher education are even higher

than they are for secondary education in most MENA countries. In fact, only in Djibouti, Iraq, and Yemen does the proportion of male students significantly surpass that of females. In Algeria, Bahrain, Iran, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Tunisia, the United Arab Emirates, and West Bank and Gaza, female students outnumber male students. Most countries achieved gender parity during the 1990s.

TABLE 1.14

### Gender Parity Index of Gross Enrollment Rate in Secondary and Tertiary Education

(female as a proportion of male)

	1970		1985		2003	
	Secondary	Tertiary	Secondary	Tertiary	Secondary	Tertiary
Algeria	0.41	0.25	0.74	0.47	1.07	1.08
Bahrain	0.72	1.29	0.99	1.70	1.06	1.84
Djibouti	0.37	—	0.62	—	0.69	0.82
Egypt, Arab Rep. of	0.49	0.37	0.70	0.46	0.93	—
Iran, Islamic Rep. of	0.51	0.35	0.66	0.4	0.94	1.11
Iraq	0.43	0.3	0.57	0.6	0.66	0.45
Jordan	0.57	0.49	1.08	0.93	1.02	1.10
Kuwait	0.81	1.16	0.91	1.16	1.06	2.72
Lebanon	0.68	0.32	0.98	—	1.09	1.12
Libya	0.23	0.13	0.94	—	1.06	1.09
Morocco	0.42	0.19	0.67	0.47	0.84	0.87
Oman	—	—	0.49	0.6	0.96	1.37
Qatar	0.72	—	1.10	2.63	0.97	2.86
Saudi Arabia	0.26	0.1	0.65	0.78	0.88	1.50
Syrian Arab Rep.	0.39	0.26	0.70	0.57	0.93	—
Tunisia	0.38	0.25	0.7	0.58	1.05	1.28
United Arab Emirates	0.32	—	1.00	1.96	1.06	3.24
West Bank and Gaza	—	—	—	—	1.05	1.04
Yemen, Rep. of	—	—	—	—	0.49	0.38
<b>Mean</b>	<b>0.48</b>	<b>0.42</b>	<b>0.79</b>	<b>0.95</b>	<b>0.94</b>	<b>1.40</b>
China	0.52	—	0.7	0.44	1.00	0.85
Indonesia	0.51	0.32	0.75	—	0.99	0.79
Korea, Rep. of	0.65	0.34	0.98	0.46	1.00	0.61
Malaysia	0.68	—	1.01	0.8	1.14	1.41
Philippines	0.94	1.28	1.02	—	1.11	1.28
Thailand	0.70	0.62	—	—	1.00	1.17
<b>Mean</b>	<b>0.67</b>	<b>0.64</b>	<b>0.89</b>	<b>0.57</b>	<b>1.04</b>	<b>1.02</b>
Argentina	1.14	0.77	1.13	1.13	1.07	1.51
Brazil	1.03	0.61	—	—	1.11	1.32
Chile	1.15	0.63	1.09	0.78	1.01	0.94
Mexico	0.64	0.26	0.95	0.61	1.07	0.97
Peru	0.77	0.54	0.90	—	1.01	1.07
<b>Mean</b>	<b>0.95</b>	<b>0.56</b>	<b>1.02</b>	<b>0.84</b>	<b>1.05</b>	<b>1.16</b>

Sources: Statistical Appendix and UNESCO Institute of Statistics (through World Bank EdStats).

## Investment in Education and Noneconomic Outcomes

In addition to the immediate impact of investment in education on human capital accumulation, this investment also has the potential of contributing to lower fertility and infant mortality rates and longer life expectancy. Such outcomes were observed in other developing countries, especially as education spread among females. Given that MENA countries have also significantly improved their gender parity over the last few decades, we should observe similar trends in the region as well. The data presented below support this prediction.

As shown in figure 1.1, MENA countries started from very high fertility and infant mortality rates and very low life expectancy in 1960 in relation to our comparator countries from East Asia and Latin America. By 2004, the MENA region had caught up with the average life expectancy of East Asia and Latin America and had brought infant mortality rates to levels very close to those of these regions. While fertility rates in MENA are still higher than in the other regions, the average number of children per woman in the region declined from seven in 1960 to three in 2004. Progress in MENA was remarkable; it outpaced the rate of progress elsewhere.

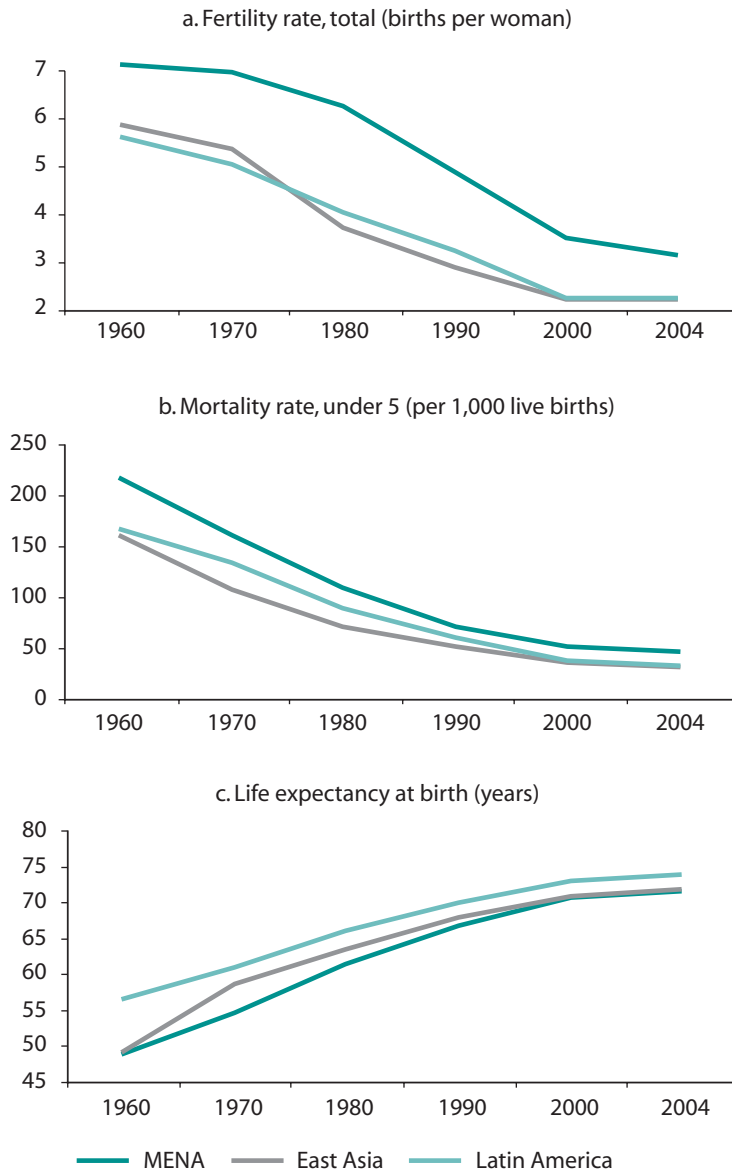
Within the region, however, significant variations remain. For example, Yemen, Djibouti, and Oman still have fertility rates of greater than four, compared with a fertility rate of two in Lebanon, Algeria, and Kuwait. Similarly, life expectancy is only 53 years in Djibouti and 61 years in Yemen, compared with 79 in Tunisia and 75 in Bahrain. Nevertheless, in all of the MENA countries, these indicators have improved over time.

## Summing Up

The countries of the MENA region got off to a late start in investing in human capital through formal schooling, but once they began, they generally spent a relatively high percentage of their GDP on education and raised the average level of schooling in their populations relatively rapidly. At present, almost all countries in the region educate their boys and girls at the primary level, and a significant percentage of the relevant age cohorts are engaged in secondary and tertiary education. Literacy rates have been reduced significantly and some countries score relatively well on international tests, especially when the level of income and gross enrollment rates are taken into account. Moreover, most countries of the region were able to achieve gender parity at almost all levels of educa-

**FIGURE 1.1**

**Fertility and Mortality Rates and Life Expectancy, 1960–2004**



Source: World Development Indicators 2005.

tion, and to improve fertility and infant mortality rates as well as life expectancy.

Notwithstanding this impressive track record, the region lags behind East Asia and to some extent Latin America in terms of the level, quality, and even distribution of human capital. The average number of years of schooling in MENA is below both regions by more than one year.

The rapid expansion of secondary and higher education was accommodated by employment in the public sector at relatively high wages rather than by increased demand for higher educated labor by a dynamic private sector. In addition, the pattern of public expenditure is biased in favor of students at higher levels of education compared with other regions, which reflects a bias in favor of the socially privileged class.

On the quality of human capital, literacy rates in the region are still low. The problem is especially acute in Yemen, Morocco, Algeria, and Egypt. In addition, because of the very low levels of initial enrollment of women, female illiteracy is even higher. The lagging investment in the education of women may have kept fertility rates from falling as soon historically and as rapidly as in other regions of the world. The picture is somewhat better when quality is assessed on the basis of the academic performance of eighth- and ninth-grade students on international tests. The results rank Lebanon, Jordan, Iran, and Tunisia at the high end, and Saudi Arabia, Morocco, and Kuwait at the low end of the test score range. When adjusted to take into account GDP per capita and gross enrollment rates, Lebanon and Jordan do as well as some of the higher scoring East Asian countries. Even then, however, the scores are much lower in math than, for example, those in Korea or Malaysia. Thus, labor in the MENA region does not have the same human capital as Malaysia or Korea.

As for the distribution of human capital, it has become worse over time in MENA when education equality is measured by the standard deviation of the years of schooling. Starting from a relatively equal distribution in the 1960s and 1970s, the standard deviation of the mean years of schooling is now higher in the region than it is in East Asia or Latin America. Surely more and more children are enrolled in schools in the region and the Gini coefficient is declining in MENA and elsewhere, as will be discussed below, but the relative educational attainment between them has widened. Meanwhile, the allocation of public expenditures seems to favor higher education, and the increasing reliance on the private sector is pursued without a clear strategy as to the level of education left to the private sector or as to how poor students may access private schools.

These generalizations clearly do not apply equally to all countries in the MENA region, which is rather heterogeneous in the degree to which countries have invested in human capital and in their investment strategies. Syria, for example, has invested much less in human capital than, say, Jordan. Morocco seems to spend much more on its secondary education students relative to primary education students than its neighbor Algeria. Given their very high average income per capita, the oil states, such as Bahrain, Kuwait, and Saudi Arabia, all seem to provide, on aver-

age, lower quality education than most other MENA countries. These differences influence the role of human capital in achieving economic growth and the distribution of its benefits in each country. Nevertheless, the region on the whole also exhibits a number of similarities. These include high levels of commitment to investment in education and gender parity, and frequently a policy of guaranteed employment in government. The question we take up next is how much past investments in education have contributed to economic growth, better income distribution, and lower poverty in the region.

## Endnotes

1. Unfortunately, information on household expenditure on education over time was not available for most MENA countries.

2. Typically, comparator countries are selected on the basis of a criterion such as per capita income. However, this criterion is not appropriate for MENA countries because they diverge widely in their per capita income. Thus, we opted for a stratified sample of countries from East Asia and Latin America because: (i) these countries seem to share some socioeconomic characteristics with the region (apparently more than countries from SSA or East Europe do), and (ii) they have made some progress on reforming their education systems.

3. The data on secondary and higher education spending in table 1.2 have to be interpreted with some care. The figures only represent the amount the *public sector* spends on all students, which would underestimate spending per pupil in countries with significant *unsubsidized* private secondary education (including Argentina, Brazil, Colombia, Indonesia, Korea, Lebanon, and Philippines) and higher education (Brazil, Chile, Korea, Philippines). Also, it would not take into consideration significant private financial contribution to public university education (Chile).

4. Net enrollment data for secondary school and university are not reported by most countries. Thus, the gross enrollment rates reported in table 1.4 have to be interpreted with caution. They tend to overestimate the proportion of the age cohort attending secondary schools, because repetition rates are high and there are many overage students at that level of instruction. The other problem with these data is that enrollment rates in tertiary include nonuniversity, postsecondary education, which varies from country to country. For example, the proportion of students in university in Argentina in 2001 was about 35 percent, but the total shown in table 1.4 for all post-secondary is 57 percent.

5. Four countries, all in Latin America, took only the PISA test. Eleven countries took only the TIMSS (all of the countries in the MENA except Tunisia fell into this category). In the cases where students only took one test, we used that single score. In the cases where the country participated in various years on the same test, we averaged the scores. To make the PISA score comparable to the TIMSS, we converted the 2000 PISA score to an estimated 1999 TIMSS score using a formula estimated by regressing the 1999 TIMSS score on the 2000 PISA in 17 countries that participated in both tests. We converted the 2003 PISA score to a 2003 TIMSS score with another formula estimated by regressing

TIMSS 2003 on PISA 2003 for 22 countries that took both tests.

The estimated equations are:  $TIMSS\ 1999 = 157.2 + 0.7165\ PISA\ 2000 + \epsilon$ , and  $TIMSS\ 2003 = 111.8 + 0.8084\ PISA\ 2003 + \epsilon$ . The intercept term of the TIMSS 1999 equation is significant at the 5 percent level; all other coefficients are significant at the 1 percent level.

In cases where a country participated in both tests, we converted the PISA test score to TIMSS equivalents and averaged the scores.

6. The international average score here is the average of the international average scores of TIMSS 1995, 1999, and 2003.

7. Murphy, Shleifer, and Vishny 1991 show that countries with a high proportion of scientific graduates have higher growth rates than do countries where most graduates come from the humanities.

8. UNESCO Institute for Statistics and Government Development Finance and World Development Indicators central database (accessed in 2006).

9. We also report the Gini coefficients of the number of years of schooling for the same set of countries in table 2.7. As will be seen in chapter 2, the education Gini coefficients tend to decline from very high values in the MENA countries because, initially, a high fraction of the population had zero years of education. Almost all other countries also exhibit declining Gini coefficients. Nevertheless, the average Gini for MENA countries between 1970 and 2000 was still greater than it was in other regions.

10. Algeria (where the private sector is prohibited from providing education at any level) and Tunisia are clear exceptions. In addition, a number of MENA countries (e.g., Syria, Morocco, and Egypt) exhibit a similar commitment to primary education as the countries in East Asia.

11. In Chile, although private education is highly subsidized through a voucher system, private contributions at the primary and secondary levels are significant and, at the tertiary level, represent 70 percent of total spending. Similarly, in Brazil and Argentina, private contributions at primary and secondary levels are large. In Brazil, 72 percent of students in higher education attend private institutions.

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