Transforming Arab Economies:
Traveling the Knowledge and Innovation Road

Full Report
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Full Report
A note to the reader

Transforming Arab Economies: Traveling the Knowledge and Innovation Road was prepared by the Center for Mediterranean Integration (CMI) with the World Bank, the European Investment Bank (EIB), and the Islamic Educational, Scientific, and Cultural Organization (ISESCO).

This document is the full version of the report. Versions in French and Arabic will be available on the CMI website (www.cmimarseille.org/ke). A short version of this report was produced in Arabic, French, and English editions, all of which are available on the same website.
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Recent events in the Arab world have shown the vital importance for countries to engage in continuous, broad-based, and inclusive development. The main challenge in the Middle East and North Africa today is to create more and better jobs. Vast numbers of unemployed or underemployed youth, male and female, now expect concrete national and regional transformation through the rapid creation of decent jobs. If the aspirations and creative forces of Arab youth can be put to work, then the region’s potential for growth, stability, social justice, and human fulfillment will be enormous.

The extent of change will depend in good part on how well the knowledge economy takes hold throughout the region. Creating jobs entails more investment in knowledge-related sectors and new emphasis on how to develop competitive, productive, and sustainable economies. Countries in the region must take advantage of the ongoing knowledge revolution to develop economies that are agile, networked, and constantly learning. The private sector must be enlisted to help build an entrepreneurial culture and create needed jobs. Such an approach is essential to cope with unemployment and pave the way for sustainable growth and economic development.

Transforming Arab Economies: Traveling the Knowledge and Innovation Road places a knowledge- and innovation-driven model at the heart of new development strategies in the region. It highlights how the knowledge and innovation approach can help Arab countries diversify their economies and innovate, creating new enterprises and jobs. The study places these issues in a suggested integrative framework, a framework that includes developing more open and entrepreneurial economies, preparing a better-educated and highly skilled population, improving innovation and research capabilities, and expanding information and communication technologies and their applications. It exhorts policy makers to adopt new policy agendas and a new type of open mindset that can lead to the creation of more jobs of higher value in a rapidly connected and globalized world.

Given the diversity of the Arab world, the study does not provide a cookie-cutter approach but rather offers examples from within the region, as well as from other countries from Finland to Korea that have put in place effective strategies to maximize the use of knowledge, innovation, and technology. Patience and determination will be required, because the fruits of investments in knowledge may not begin to appear for a few years.

Putting this type of approach to work in any country requires a vision and strategy on the part of each country in the region. Fostering greater integration within the Arab world and around the Mediterranean would be a key booster for this approach. This is where the Center for Mediterranean Integration can add value. CMI is a place for dialogue, a place where all stakeholders—from governments, academia, the private sector, and civil society—can engage in open exchange on how to make an effective transition to the knowledge economy.

Given the events of the Arab Spring, there is no time to lose and no reason for complacency. Countries need to be pragmatic and to take advantage of opportunities as and when they arise. I hope that this report can be useful in providing insights into how countries in the Arab world can develop strategies that are adapted to the challenges and opportunities of our time.

Mats Karlsson, Director, Center for Mediterranean Integration
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The Arab Spring uprisings sounded a political alarm throughout the region, attesting to a thirst for change after decades of stagnation. But huge problems remain, chief among them the need for more and better jobs, particularly for the young, whose rates of joblessness are the worst in the world: about 25 percent among individuals between the ages of 15 and 25. It is estimated that 40 million new jobs will have to be created in the Middle East and North Africa (MENA) in the next decade.

This report explores development strategies that hold the potential to create more jobs in the Arab world. The knowledge economy approach seeks to foster employment by using knowledge and innovation to enhance productivity and competitiveness in order to take advantage of opportunities in the global economy. Development strategies based on the knowledge economy follow a model that has become increasingly common around the world. According to estimates presented in this study, such strategies could contribute significantly to increasing the rate of job creation in countries across the region.

What types of policies can place a knowledge- and innovation-based, productivity-driven growth model at the center of development strategies for countries in the Arab world? This study highlights key elements of such policies, while recognizing that several Arab countries are already pointing the way, inspired by good practices in other countries around the world, notably the recent success stories of the Asian tigers (such as the Republic of Korea and Singapore) and the Nordic countries (particularly Finland and Denmark).

The path starts with good governance and a business-friendly environment—that is, one favorable for growth and investment, including investment by foreign firms and investors. Several Arab countries have already taken already steps in this direction, often by facilitating the development of new firms and clusters of new activities. The value of good governance and a business-friendly environment is key to any development strategy, especially if countries are to get the maximum benefit from their efforts in areas particularly important to the knowledge economy—namely, education, innovation, and information and communication technology (ICT).

To the maximum extent possible, reforms in these four areas—governance and the business climate, education, innovation, and ICT—should be carried out across the economy. But it is also important to be opportunistic, to seize opportunities and take action in selected sectors, traditional and new, and in locales where it may be possible to capitalize on comparative advantages and to reach a critical mass of entrepreneurial and innovative initiatives. Seizing localized opportunities can create clusters of growth that help to diversify the economy. Successfully exploiting such opportunities sets in motion and propels a virtuous cycle of growing confidence that demonstrates to the popula-

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1. As observed by the Organisation for Economic Co-operation and Development in 1996, “OECD economies are increasingly based on knowledge and information. Knowledge is now recognized as the driver of productivity and economic growth, leading to a new focus on the role of information, technology and learning in economic performance. The term ‘knowledge-based economy’ stems from this fuller recognition of the place of knowledge and technology in modern OECD economies.” See also World Bank (2007).
Executive summary

Toward economies that are more productive and competitive and that create more jobs

To date, most Arab countries have based their economic growth and competitiveness on the exploitation of natural resources, on infrastructure development, and on financial markets. There is now ample room in which to orient economies toward development systems that are richer in knowledge and innovation, thereby further increasing total factor productivity, which in the past few years has already shown signs of improvement in the region.

Tomorrow’s more productive and competitive economies will generate more jobs at higher skill levels that are also more likely to be sustainable. And they will do so in a big way: According to estimates measuring the contribution of the knowledge economy to employment in the region (through higher growth), a stronger knowledge economy effort may increase the annual rate of job creation by 30–50 percent (the impact being larger in the oil-importing countries). To obtain these results, which are not out of reach, countries will need to take steps to put in place a set of policies that underpin knowledge-based development strategies.

What to do

Enact business-friendly and governance reforms

Sound macroeconomic policies, good governance, and a business-friendly climate provide the basis for knowledge-based strategies, as they do for virtually all development strategies. To make an effective transition to the knowledge economy, it is necessary to continue to improve the business climate in order to stimulate business formation and attract foreign investment, which together foster growth and competitiveness. Several Arab countries, including Morocco, Egypt, Jordan, and Saudi Arabia, have made substantial progress over the past 10 years in this area, heeding demands for change from the business community and making the best of assistance from international institutions. In some cases, the events triggered by the Arab Spring have slowed the pace of reforms, even in countries not suffering from political disturbances or outright civil war. To be credible, necessary reforms should be resumed and deepened as soon as possible to build momentum for the transition to a knowledge economy.

The value added of this work stems from the integrative nature of the knowledge economy approach, which can help countries in the region reexamine their development strategies in a coordinated manner, rather than through sectoral strategies prepared and implemented in isolation. It summarizes the “state of play” on the knowledge economy in the Arab world at large, while also highlighting the efforts made by individual countries in different domains, providing examples of good practice from countries around the world and policy recommendations to help guide efforts, which should be customized to the specific circumstances of each country.

The success of such development strategies depends on a participatory process that involves a wide range of actors in government, the business community, academia, research organizations, and other key institutions. In managing that process, the government should display both leadership and the willingness to listen to key economic and social actors, particularly from the private sector, which should become a partner in the process and an engine for growth and employment creation. By using such a participatory process to implement knowledge and innovation policies, the government can foster a new social contract with its citizenry, breaking with the centralized and authoritarian practices that have long prevailed in the region. It is the role of the government to formulate a compelling vision that is both ambitious and realistic. By accomplishing concrete projects, even if small in size and scope (starting small can be a good way to begin), the vision gains credibility and becomes reality.

It goes without saying that the development strategies described above must be adapted to the cultural, institutional, and economic characteristics and circumstances of each country. Similarly, within each country, care must be taken to adapt policies to the needs, wishes, and capacities of the various segments of the population and in diverse areas.

Cooperation within the Arab world in the domains of the knowledge economy offers substantial benefits to all participants. It would accelerate the formation of the critical mass needed for sustainable success in innovation and other areas, while also advancing collective learning. Equally important is the advancement of integration between the Arab world and Europe (through the interface of the Mediterranean Sea) in business, finance, and academia. Integration—centered on concrete projects and supported by regional and international institutions and bilateral programs—provides an important opportunity to score wins for all participants.

Such are the principles that inspire and guide the policies proposed in this study for countries that seek to make better use of knowledge and innovation in their overall development trajectories. The strategies already initiated by several countries of the region should now be amplified and brought to scale to meet the challenges confronting the changing Arab world.

The value added of this work stems from the integrative nature of the knowledge economy approach, which can help countries in the region reexamine their development strategies in a coordinated manner, rather than through sectoral strategies prepared and implemented in isolation. It summarizes the “state of play” on the knowledge economy in the Arab world at large, while also highlighting the efforts made by individual countries in different domains, providing examples of good practice from countries around the world and policy recommendations to help guide efforts, which should be customized to the specific circumstances of each country.
In addition, it is important to facilitate the emergence of entrepreneurial activity, to reduce bureaucracy in its various forms, to eliminate regulations that stifle initiative, to remove unearned privileges currently enjoyed by groups close to ruling powers, to ensure competition, and to expand sources of financing, including Islamic finance, which, in principle, should favor innovation by encouraging the sharing of profits and risks.

To complement the changes evoked above, trade channels must be widened, customs barriers lowered, and exchanges of technology facilitated. Logistical platforms must be improved and expanded, as has been done, for example, by Morocco at the port of Tangiers. The establishment of special industrial zones makes it possible to attract foreign firms and to promote exports through various incentives. Such zones make the most sense if they also stimulate the local economy through the development of subcontracting links and new business spinoffs, and if they are not used as an excuse to delay reform in the rest of the economy.

At the heart of good governance is the struggle against corruption in all its forms, large and small. Measures to curb corruption cannot fail to benefit society, if only through the positive signs that they send to the population about openness, transparency, and accountability. Other essential elements are freedom of expression and the flowering of democratic practices. It is encouraging to see that in several countries the political processes set in motion by the Arab Spring have led to democratic advances that, while still tenuous, show signs of being here to stay.

Create a climate of innovation

Innovation energizes and renews the productive foundations of economies and societies. But to reap the full benefits of innovation, certain fundamentals must be heeded. To begin with, it is necessary to debunk the notion that innovation proceeds only from the actions of entrepreneurs who exploit technological or scientific opportunities to satisfy needs or markets that they have identified.

Therefore innovation policy should begin with mechanisms to support innovators: technical, commercial, legal, and financial support provided through structures such as incubators that operate as close as possible to innovators. Incubators have proliferated in the Arab countries, as they have elsewhere, but have had uneven results in the region, often because they lack appropriate management and professionalism, and connections to adequate technical or commercial networks and to sources of venture capital. (Some countries, such as Lebanon, have been able to devise ways of mobilizing capital using public guarantees.) Innovators also need full access to technological services to test their ideas and inventions, and the environment in which they operate must offer efficient standards, measurement equipment, and related infrastructure.

Public and academic research structures in the region would do well to be systematically evaluated. A strict criterion of excellence should be applied when evaluating basic research efforts, whereas economic, social, and environmental relevance are the most appropriate considerations when evaluating applied research. Cooperation between universities and the business world is essential to the process of innovation; regulations and obstacles that prevent such collaboration should be removed. The availability of public subsidies—in the form of matching funds that businesses contribute to specific projects—stimulates academic–corporate cooperation, a fact amply demonstrated by experiences around the world. Several countries, such as Egypt, have implemented well-designed programs in this area.

Provide more and better education

Education is the key enabler of a knowledge- and innovation-driven economy. Tremendous progress has been made across the Arab region in widening access to education. But although the countries of the Arab world have invested a respectable share of their gross domestic product (GDP) in education, those efforts are not yielding the expected results: more schooling has not been synonymous with more learning in most parts of the Arab world. International achievement tests reveal that students in the Arab countries still trail those of many other countries at comparable levels of development in the acquisition of basic knowledge.

Greater investment in early child development could help give Arab children a solid start. Moving on to the education system as a whole, teaching methods that remain based on rote learning could usefully be revised, the quality of teaching materials could be upgraded, and the qualifications of teachers could be raised. Some countries, notably Jordan, have already implemented ambitious programs that have substantially improved educational levels.

Mismatch between the skill needs of the economy and the outputs of the education and training system are apparent. Technical and professional education across the region needs an overhaul. Cooperative education schemes delivered in partnership with employers seem to work well, as demonstrated by international experience, including a number of pilot programs in countries such as Tunisia. New ways of connecting education and employment must also be explored, such as the multinational Education for Employment initiative that is ongoing in Egypt, Jordan, Palestine, Morocco, Yemen, and Tunisia, and which deserves to be expanded and introduced in the rest of the region.

In higher education the vast majority of students choose programs in the humanities and social sciences, and many graduates of those programs have difficulty finding jobs. The most effective way to ameliorate this situation is to improve the quality of scientific and technical education upstream—in secondary and even primary school. The establishment of new universities in partnership with prestigious foreign institutions has already begun to raise scientific and technological capacities in several countries, improving their international competitive position. Members of the Gulf Cooperation Council—such as Dubai, Saudi Arabia, and Qatar—have shown the way in this area.
And finally there is the issue of accessing, tapping, and using the foreign technology that is abundantly available through a variety of channels (for example, multinational companies operating within the country). Several initiatives in the region, including those of Morocco in the automobile and aeronautics industries, and in Jordan in information technology, point the way in this area.

Promote an information society

ICTs are the backbone of modern economies, as transportation and electricity were in the previous century. Arab countries have invested heavily in ICTs over the past 15 years. Mobile phone networks have been considerably developed across the region, as in most of the world. Together with related services and industries, ICTs can account for a significant share of GDP in countries of the region (for example, up to 15 percent of GDP in Jordan).

Progress has been slow in expanding Internet access, however, which now reaches only a quarter of the population of the Arab region. A mere 5 percent enjoy broadband access. Greater competition among providers would help to lower prices and improve services for users. Other areas for improvement include upgrading education and training in ICTs, developing more Arabic-language Web content, and, most important, expanding the range of ICT applications used in business, government, education, services, and elsewhere. Several countries, including Jordan and Saudi Arabia, have launched ambitious pilot programs to develop ICT applications for various industries, such as e-learning and e-government.

Develop dynamic sites and locales

Modern economies develop around dynamic sites in which talented and skilled individuals rub elbows with one another and with employers, entrepreneurs, and financiers. Governments endeavor to create such sites in the form of science and technology parks, often located within special economic zones in which exceptional regulatory or fiscal policies are applied. Such government-sponsored sites have proliferated in the Arab world, which presently has some 50 technology parks. The task now is to ensure that these sites are effective and efficient, that business-academic cooperation takes place actively, and that entrepreneurs are able to find the networks and other support they need—all of which are necessary if competitive clusters are to form. A rigorous evaluation of the efforts made to date in the Arab world would draw lessons from success stories and take steps to ensure that management and financial arrangements are effective.

Knowledge and innovation can be useful in efforts to diversify economic activities in rural areas. Developing rural areas requires investments in infrastructure, the organization of producers’ cooperatives, technical and management training, and, possibly, the formation of clusters (for example, in agrifood industries) that bring together in one location facilities and infrastructure for research and development, manufacturing, commercialization, and logistics, all of which can help rural producers move up the value chain.

Implement participatory policies as the foundation for a new social contract

The ways in which knowledge-based development strategies are implemented is crucial for their success. Well-designed actions can build trust and self-confidence, which together are often referred as the fifth pillar of the knowledge-based economy.
### Executive summary

The transition to a knowledge- and innovation-based economy depends on the participation of people at all levels and in every corner of society. This agenda cannot and should not be the government’s alone; instead, it requires consultation with and participation of stakeholders from the private sector and civil society, including academia, think tanks, and, importantly, the media. In a sense, there is need to work on the four pillars through a combination of top-down reforms and bottom-up initiatives, buttressed by a well-communicated vision.

As people’s energy emerges it spawns new economic activities that have the potential to create wealth and jobs, pushing to the forefront of reformers, change agents, and other proponents of sustainable transformation. The imperative of nurturing this vital process of social renewal points to the importance of effective policies of decentralization and deconcentration of power, similar to those recently taken in Morocco. Encouraging the flowering of productive energy helps foment a dynamic for change throughout society, while also building a critical mass of new initiatives. Together these effects improve the climate for reform. The multiplication of dynamic sites and sectors that spin off new activities and create jobs eventually shifts the economy into a new mode—a growth mode, triggering a virtuous cycle of change and renewal.

Among the change agents who are capable of catalyzing these changes are members of the diaspora, especially those with advanced qualifications [scientific, entrepreneurial, or other], who have a key role to play by lending their commercial, financial, and technical support. Nowhere are the positive effects of this support clearer than in Lebanon. Diaspora members can also contribute to the national conversation on improving governance, as one sees today in Algeria.

The role of the media should not be overlooked. Television networks that cover the Arab region have an important role to play in stimulating pride and interest in innovative developments in cities, firms, schools, and laboratories that are helping to create jobs, improve living conditions, and protect the environment. Social media are very powerful tools for propagating such information, notably among young people.

It may be appropriate and effective to develop the connection between the proposed new development model, based on knowledge and innovation, and the deepest principles of Islam, whose holy book contains many passages that emphasize the importance of knowledge and the need to apply knowledge for the good of society.

And finally there is the key question of the status and role of women. Participation in the modern world and active engagement in the knowledge economy require the talents of an entire country. In several countries of the region, women’s educational achievements outpace those of men. The full, unfettered entry of women into the labor force would do much to benefit every country’s economy, while also boosting women’s status in economic life and in society at large in the Arab world.

#### Enhance cooperation in the Arab world and the Mediterranean basin

A knowledge-based development strategy takes advantage of the dramatic reduction in the cost of sharing and trading goods and services, finance, and information. To fully exploit these opportunities, however, Arab countries will have to do more in the areas of regional integration and international cooperation. Indeed, economic integration through increased trade and foreign direct investment (FDI) may be the best way to put the countries of the region on a path to higher, more sustainable economic growth and greater employment.

The absence of a single market limits trade within the region, which is three times lower than trade among the developing countries of Asia. Thus even small steps toward trade integration would be beneficial. With respect to education, research, and innovation, joint programs under a framework modeled on the Lisbon Agenda of the European Union (EU) would make it easier for Arab countries to build and benefit from the necessary critical mass of resources, talent, and markets. In the realm of infrastructure, large-scale cooperative projects in water, transportation, and other areas would allow for the introduction of innovations, while also creating many jobs.

Integration within the Mediterranean basin would bring considerable benefits to the countries of the southern and eastern rims by enlarging possibilities for market growth and employment in the north. Several ambitious projects have already begun, such as the Desertec solar energy project; other worthy initiatives should be scaled up. European and Arab governments alike should give such initiatives a closer look. Much can be accomplished through the consolidation of existing regional networks of academics, entrepreneurs, financiers, city managers, and others—networks that have engendered a wide range of promising initiatives in the form of joint research and development (R&D), education, and other programs, as well as in joint learning activities.

Euro-Mediterranean cooperation is particularly important to support the modernization of higher education in the Arab world. Some countries such as Morocco, Tunisia, Algeria, Lebanon, and Egypt have adopted the LMD (licence [bachelor], master, and doctorate) degree ladder around which European academic programs and degrees have been standardized. On the research side of academia, multicountry R&D platforms serving common goals supported by EU funding have proven their utility, as have international programs that match funds provided by Arab countries. The latter have been particularly useful for the promotion of innovative projects involving research, technology incubators, and venture capital. Regional efforts in ICT can also strengthen cooperation in the development of telecommunication infrastructure.
There is a role for regional and international organizations as well. The EU, the European Investment Bank, the World Bank, and the United Nations Development Programme, for example, have a crucial role to play in accelerating the implementation of knowledge-based development strategies in Arab countries and in the integration process in the Mediterranean area. In a similar vein, regional organizations such as the Islamic Development Bank, the Islamic Educational, Scientific, and Cultural Organization, and the African Development Bank can do much to facilitate the progress of knowledge-economy strategies in the region.

Moving forward:
Diverse countries with a variety of strengths

As this report makes abundantly clear, there is great diversity in the Arab world. The countries of the region possess different strengths. They differ widely in their circumstances—some rich in oil and gas resources, some poor in such resources, and some beset by political conflict or even civil war. They differ widely, too, in the level and pace of their engagement with a knowledge- and innovation-driven growth model. Many have adopted original solutions that may, along with the experiences of other countries around the world, serve as examples to their neighbors. It is incumbent upon each country to find the combination of measures that suits it best, drawing inspiration from what others, both in the Arab world and elsewhere, have been able to accomplish.

The Arab countries of the Mediterranean that lack oil resources will have to make the best possible use of the assets that they do possess. And the best way to do that is to proceed steadily with well-conceived reforms of their institutions. Several of these countries—Jordan, Morocco, and Tunisia—have substantial capacities that have already enabled them to launch significant initiatives based in the knowledge economy, focused on sectors or regions. For these countries, the task is to push ahead, accelerate, or relaunch reforms that have already begun, taking care to ensure their efficacy in promoting innovation, diversification, and job creation, all of which are crucial for improving the overall climate for reform.

Several of the oil-rich countries, such as Saudi Arabia, the United Arab Emirates (UAE), and Qatar, have made massive investments inspired by the knowledge economy model. These investments—in new universities, cities, and services (media, finance, and so on)—contribute to what must be a key aim: economic diversification. Those contributions will have to be complemented by measures that create jobs, provide technical training, and encourage the formation of new businesses. It is also critical that the oil-rich countries increase the administrative and managerial capacities of their citizens, so that they can gradually replace the many expatriates brought in to fill key positions over the past decade.

Turning to the countries that are beset by political and military conflict, it may be necessary to wait until peace returns before attempting to implement major new economic policies, but it is important to acknowledge the opportunities presented by pockets of academic, scientific, and business competence that have survived despite the surrounding troubles. Reconstruction projects and infrastructure investments may offer opportunities for future growth, innovation, and jobs (including highly skilled employment) that should not be overlooked.

A last word

This study is a humble look at the situation of the Arab world from the perspective of the knowledge economy, a powerful concept that can lead to growth and to economic and social development. The opportunities for an efficient economic response by the countries of the region to the unfolding events of the Arab Spring should be seized. But seizing the moment will require a well-considered, customized, and action-oriented investigation of the unique circumstances of each country. Indeed, the current situation calls for the formation of a regional coalition of reformers—individuals and groups capable of transcending the inherited divisions within and between countries of divergent and sometimes conflicting histories. The Arab peoples already feel that they are members of a community, the Umma, which should favor efforts in mutual cooperation. The knowledge economy also resonates with the historical prominence of knowledge and science in Arab culture and in Islam. If the Arab world can rise to the challenge of political renewal that has been sounded throughout the region, it has within its power the ability to rediscover the path of social and cultural flowering that it walked 10 centuries ago during its golden age.

Organization of the report

The report is made up of three parts and includes three annexes.

Part 1 deals with three fundamental questions surrounding the proposed development model based on knowledge and innovation: Why make the move to a knowledge- and innovation-driven economy (chapter 1)? What would that move entail (chapter 2)? How should it be done (chapter 3)?

Part 2 delves into the policy orientations related to the overall economic and governance regime (chapter 4), education (chapter 5), innovation (chapter 6), and ICTs (chapter 7), and the kinds of policy reforms and initiatives that may be needed in each area.
Part 3 discusses the promotion of growth sectors (chapter 8) and the management of local and regional development (chapter 9) as key elements of economic diversification.

Annex 1 provides a literature review of the relationships among the knowledge economy, growth, and employment and develops a methodological approach to link the knowledge economy to job creation in the MENA region.

Annex 2 provides insights into experiences developing knowledge-based development strategies from around the world.

Annex 3 surveys knowledge economy issues in different Arab countries and highlights policy initiatives that are adapted to their specific country circumstances.

References and bibliography


We know that the source of wealth is something specifically human: knowledge.
If we apply it to tasks we already know how to do, we call it “productivity.”
If we apply it to tasks that are new and different, we call it “innovation.”
Only knowledge allows us to achieve those two goals.

—Peter Drucker, Managing for the Future, 1992

A knowledge-based economy is one that acquires, creates, disseminates, and uses knowledge to enhance its growth and development. Knowledge and innovation have always played a crucial role in economic and social development. But not until now has knowledge been the key driver of competitiveness, since globalization and new technology have profoundly reshaped the patterns of the world’s economic growth and activity over the past few decades. More and more countries are embracing knowledge- and innovation-related policies to spur growth and competitiveness. These countries are moving up the global value chain by broadening and deepening the product and service lines they offer and increasingly participating in international trade. Investing in the knowledge economy means investing in strategies that will bring about significant changes in the way a country can grow. The global economic and financial crisis that has plagued the world economy since 2008 accentuates the need to draw upon knowledge and innovation to facilitate the needed response.

Knowledge, productivity, and innovation strongly influence competitiveness, economic growth, and development. Since the emergence of classical economic theory in the 18th century, economists have sought to determine the sources of economic growth, from Adam Smith’s examination of the division of labor in The Wealth of Nations, to Joseph Schumpeter’s analysis of the importance of innovation in capitalism in the mid-20th century. After the Second World War, Robert Solow (1956) offered a unified analytical framework, according to which economic growth is ultimately determined by extra-economic, exogenous factors such as technological progress. The need to assess the importance of technological progress for sustainable growth, including related investments in areas such as education, created the impetus for new growth theories in which technological progress is determined endogenously. The effects of knowledge-economy-related investments are roughly measured through total factor productivity (TFP), which accounts for economic growth induced by factors other than increases in labor and capital.

The knowledge economy is not just about information and communication technology (ICT) or high-tech industries. It differs from the notions of the information society and the innovation-driven economy (box I.1). In contrast to these, the knowledge economy approach should be seen in a broad perspective, as the foundation of a development strategy. Knowledge is a powerful tool that makes it possible to increase productivity and innovation across all sectors of the economy and to develop competitive and sustainable economic activities. As countries diversify their economies, new enterprises and jobs are created. Ultimately, economic development becomes a process of generating and tapping relevant knowledge—and putting that knowledge to work to generate further growth.

This approach focuses on enhancing the drivers of growth, that is, enhancing the quality of human and physical capital, and, in particular, on raising TFP. According to Yusuf (Nallari and others 2011), the rich empirical literature on growth shows that for low- and middle-income countries, capital is the principal determinant of growth, with labor and TFP trailing well behind. But upper-middle- and high-income countries derive more of their growth from gains in TFP, and the consensus among researchers is that, over the longer term, growth is a function of TFP. Successful development is predicated not only on a facilitating external environment and good policies but also on domestic political dynamics that support development. Even weak states can grow if policies are conducive and the business sector is motivated.

To remain competitive in the global economy of the 21st century, it will be increasingly important to invest in high-quality knowledge (as distinct from traditional capital inputs), so as to make each sector of the economy more efficient. Figure I.1 illustrates the strong links between knowledge and growth. Singapore and Finland—two small, relatively resource-poor countries—achieved rapid growth between 1990 and 2007 thanks to a long-term growth strategy based on human capital and technology, a strategy that enjoyed broad political support. These developments equipped the three countries to assemble an effective, globally networked learning and innovation system that generated high-quality skills, and to build the institutions needed to coordinate the workings of such a system (Yusuf and Nabeshima 2012).

1. TFP has long been a catchall for other factors, the measurement and individual contributions of which have proved difficult to pin down (Nallari and others 2011). Among a long list, six factors are most amenable to policy action: human capital (measured in a variety of ways) and its quality; technological capability and innovation; managerial skills; organizational effectiveness; institutions affecting incentives, competition, allocative efficiency, and governance; and the characteristics of urbanization. Typically, all six affect the production and use of knowledge, resource allocation, and productive utilization.
Introduction

Fast, sustained growth is not a miracle—it is attainable for developing countries with the right mix of ingredients. The Commission on Growth and Development (2008), a high-level panel chaired by Nobel laureate Michael Spence, examined 13 of the world’s economies that had achieved average annual growth rates of at least 7 percent for 25 years or more in the post-WWII period. These high-growth countries benefited from knowledge and innovation in two ways. One, they imported ideas, technology, and know-how from the rest of the world. Two, they exploited global demand, which provided a deep, elastic market for their goods. The inflow of knowledge dramatically increased the economy’s productive potential; the global market provided the demand necessary to fulfill it. Put simply, “they imported what the rest of the world knew and exported what it wanted.”

Transforming Arab economies: Traveling the knowledge and innovation road

This report is designed to assist Arab countries to adopt, in a manner consistent with their preferences and circumstances (box I.2), the paradigm of knowledge- and innovation-driven economic growth that has taken hold throughout the world. In at least one way, the paradigm is a natural fit for the Arab world, whose global precedence in science and technology during the Middle Ages remains a source of pride. In echoing those accomplishments, the new knowledge economy would represent a renaissance for the region.

Recent events, ignited by the Arab Spring, have shown the vital importance for countries in the Arab world to engage in continuous, broad-based, and inclusive development. For too long, poor governance in the region has obstructed change. The private sector has been stymied by the constraints of privilege, limits on competition, intractable bureaucracies, and corruption. Many countries in the region have achieved relatively high levels of educational attainment; the challenge now is to provide more and better jobs for this large cohort of educated women and men. Women expect a reprioritization of gender issues in national agendas so that they will not remain an untapped human resource. If the aspirations and creative forces of Arab youth can be put to work, then the region’s potential for growth, social justice, and cohesion will be enormous.

Over the past decade, annual growth in the Arab world has exceeded 4 percent (figure I.2). The improved performance is largely the result of improved macroeconomic management and steadily rising commodity prices. Many countries have reduced the barriers to trade and removed some of the bottlenecks to private sector investment. Although there is still some way to go in all these areas, the countries that have

2. Botswana, Brazil; China; Hong Kong SAR, China; Indonesia; Japan, the Republic of Korea; Malaysia; Malta; Oman; Singapore; Taiwan, China; and Thailand
What's in a name? A comparison of the terms “knowledge-based economy,” “information society,” and “innovation-driven society”

Knowledge-based economy
In 1996 the Organisation for Economic Co-operation and Development declared that “OECD economies are increasingly based on knowledge and information. Knowledge is now recognized as the driver of productivity and economic growth, leading to a new focus on the role of information, technology, and learning in economic performance. The term ‘knowledge-based economy’ stems from this fuller recognition of the place of knowledge and technology in modern OECD economies.”

In 2005 the OECD highlighted that the “knowledge-based economy” described trends in advanced economies toward greater dependence on knowledge, information, and skill, and the increasing need for ready access to all of these by business and government.

Information society
Again according to the OECD [1996], the growing codification of knowledge and its transmission through communications and computer networks has given rise to the “information society.” As acknowledged at the 2005 World Summit on the Information Society organized by the International Telecommunications Union in Tunis, the digital revolution in information and communication technologies has created the platform for a free flow of information, ideas, and knowledge across the globe. The Internet has become an important global resource; a critical business and social tool in the developed world, and, in the developing world, a passport to equitable political participation and economic, social, and educational development. At the 2003 summit in Geneva, world leaders declared their “common desire and commitment to build a people-centered, inclusive, and development-oriented Information Society, where everyone can create, access, utilize, and share information and knowledge, enabling individuals, communities, and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life.”

Innovation-driven economy
According to the OECD’s Innovation Strategy (2010), the search for new sources of growth comes at a time when many countries have stagnating or declining populations and face diminishing returns from investments in labor and physical capital. In the long term, the slowdown in population growth precludes or at least limits the promise of a growth strategy based on low-cost labor. Innovation—which involves the introduction of a new or significantly improved product, process, or method—will increasingly be needed to drive growth and employment and to improve living standards. This is true as well for emerging economies that look to innovation as a way to enhance competitiveness, diversity, and move toward economic activities with greater value added.

The numerous determinants of competitiveness interact in a complex manner. The World Economic Forum’s (WEF’s) Global Competitiveness Index, the results of which are published annually, takes into account the fact that the different dimensions of competitiveness are not of equal importance to all countries. As a country advances in economic terms, its products and services must become increasingly sophisticated to sustain the productivity increases that enable rising wage levels. The index therefore applies different weighting schemes depending on a country’s level of development. Economies are grouped in three stages of development: the factor-driven stage, the efficiency-driven stage, and the innovation-driven stage, based on their GDP per capita and the importance of natural resources to their economy.*


Note: a. Key variables for each stage of development are described in chapter 2, footnote 5.

Grouping the countries of the Arab world
This study covers all Arab countries, with the exceptions of Comoros, Mauritania, Somalia, and Sudan. Reference is often made to the Middle East and North Africa (MENA) as a geographic region; however, Iran, Israel, and Malta are not covered by this study, as they are not Arab countries.

To be useful, any assessment of the economic challenges facing the Arab region must take into account the region’s great diversity. The region is so diverse, in fact, that it can be segmented in many different ways. Two defining characteristics of MENA countries are the distribution of oil resources and the size of native populations. Based on these two factors, the MENA countries can be classified into three main groups:

- **Resource-rich, labor-abundant countries** that are producers and exporters of oil and gas and have large native populations that make up the vast majority of residents. This group of countries includes Algeria, Iraq, Syria, and Yemen.

- **Resource-rich, labor-importing countries** that are producers and exporters of oil and gas and have large shares of foreign or expatriate residents who represent a significant percentage (or even the majority) of the total population. This group of countries comprises the members of the Gulf Cooperation Council (GCC)—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE)—plus Libya.

- **Resource-poor countries** that are net importers of oil and gas. These countries include Djibouti, Egypt, Jordan, Lebanon, Mauritania, Morocco, Tunisia, and West Bank and Gaza.

Source: WEF and OECD 2011.

Note: a. The MENA region within the World Bank is made up of Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, the UAE, West Bank and Gaza, and Yemen.
Introduction

Put their economic house in order have been rewarded with robust growth. It must be noted, however, that the region’s overall pattern of growth remains tied to hydrocarbons and other capital-intensive sectors.

But the region’s robust economic growth has not made a significant dent in unemployment. Unemployment in MENA is high and overwhelmingly affects youth (figure I.3). Youth unemployment rates vary substantially across countries in the region, ranging from 18 percent to 43 percent. The average unemployment rate for Arabs aged 18–25 is 25 percent, while the world average is about 11 percent (figure I.4). Young women face even higher rates of unemployment (estimated at 40 percent in both Egypt and Jordan). The direct opportunity cost of youth unemployment in the Arab world is estimated at up to $50 billion a year (Zoellick 2011).

Job creation in the region has not kept pace with growth in the labor force. Nor is it meeting the needs and aspirations of the young in MENA countries. It is estimated that more than 10 million young people enter the labor market annually, including an increasing number of women, yet only a tiny fraction of them can currently expect to find formal employment. To accommodate them, approximately 40 million jobs will have to be created in the coming decade (figure I.5). Those jobs will have to be not only more plentiful, but also of better quality—often referred to as decent jobs, better-paid jobs, or jobs with higher value-added. This demographic phenomenon presents an unprecedented challenge—indeed, few topics in the Middle East merit more attention than the pressing issue of youth employment.

The region must launch its own employment miracle. MENA countries that are on the hunt for employment miracles, defined by the World Bank (2012) as large and sustained reductions in unemployment, should invest in prudent macroeconomic management, sound business regulation and good governance, and associated improvements in regulatory frameworks and their enforcement. In addition, the challenge of informal

3. The MENA region is overwhelmingly young. Currently, more than 100 million people between the ages of 15 and 29 live in the Middle East, making up 30 percent of the region’s population and almost 47 percent of the working age population (Wrigley 2010).

4. Although employment miracles have not been common in the MENA region, they occur fairly frequently elsewhere in the world. Algeria and Morocco are the only two MENA countries that have experienced employment miracles in the last three decades, where large reductions in unemployment were accompanied by accelerating growth and more flexible regulation.
employment needs to be tackled, as informal workers in most MENA countries are engaged in low-productivity jobs (Gatti and others 2011). Given the events of the recent past, the extent of change will depend in large part on how well the knowledge economy approach takes hold throughout the region. Now more than ever, creating jobs in the Arab world entails more investment in knowledge-related sectors and new emphasis on how to develop competitive, productive, and sustainable economies. As economies grow and develop, their structure may well change, evolving from agriculture and manufacturing to more sophisticated knowledge-intensive services, which account for a growing share of world employment.

Greater participation in trade is another key to economic modernization, diversification, and employment, as it brings opportunities for growth, investment, and innovation—within the region, with Europe, and with the rest of the world—and helps countries move up the global value chain. As a region bordering Europe, MENA can also draw valuable lessons from nearly two decades of economic growth in Europe and Central Asia.

This dynamic process of knowledge and wealth creation offers great possibilities to enhance growth and competitiveness for the region’s diverse set of countries in the medium to long term. Most oil-importing (resource-poor) countries in the region are middle-income countries that have achieved universal basic education and are poised to realize faster growth; they can build on this asset and exploit opportunities for economic diversification. The oil exporters (resource-rich countries) are now grappling with the transition from an oil-based to a knowledge-based economy that can create meaningful employment opportunities for their youthful populations and sustain them when their fossil fuel endowments are depleted.

To make the transition to a new development strategy based on knowledge and innovation, countries in the region need to act consistently on four key pillars. Countries would do well to revisit their national development strategies and policies and adopt a more holistic approach, starting with the four-pillar framework of the knowledge economy, as defined in table I.1. Transitioning to a knowledge-based economy requires effective action—reform, investment, and coordination—in all four of these areas. Box I.3 highlights the Knowledge Assessment Methodology, a benchmarking tool to compare country preparedness for the knowledge economy.

Specific policies related to the four pillars will have to reflect the level of development of different countries in the MENA region. They will often need to be gradual, rather than taking a “big-bang” approach. Given their economic diversity, the countries of the region will need to exploit the potential of various sectors—traditional and new—as sources of productivity enhancement, growth, and job creation.

It will be important to promote sources of economic diversification through focused actions. While pursuing reforms nationwide, governments may also find it appropriate to promote, using the four-pillar knowledge economy approach, new or established sectors that offer high growth potential, as well as

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5. Some MENA economies are among the most informal in the world. It will be necessary to develop a host of policies—relating to labor regulations to promote labor mobility, support for workers in periods of transition, and greater productivity through training and skills upgrading—to remove existing barriers and to lead to the creation of high-quality jobs in the formal sector.

6. The services sector provided the largest share of world jobs in 2006 (accounting for 40 percent of global GDP), with agriculture at 38.7 percent and industry at 21.3 percent. Services overtook agriculture for the first time in history in 2006. Roughly 22 million manufacturing jobs disappeared globally between 1995 and 2002, with even China losing around 15 million such jobs. The need to think of innovation in terms of services has therefore never been more important [World Bank 2010].
sites devoted to the nurturing of innovative capabilities, such as technoparks, industrial clusters, new cities, and dynamic spots in depleted areas (box I.4). Such sectors and sites can become a key source of economic diversification, productivity enhancement, and job creation.

The private sector needs to become a key engine for stronger growth and employment creation. While significant economic reforms have been launched in the region, private sector dynamism remains relatively muted. The process of creative destruction, which led to technological upgrading in fast-growing East Asian and Eastern European economies, has so far been limited in the private sector of the region’s economies (Gatti and others 2013). It is therefore important now to unleash the untapped potential of the private sector, formal and informal, to develop an entrepreneurial culture rooted in trade and integration. A more vibrant private sector in MENA countries will also contribute to increased economic integration within the region. With a conducive business environment, new entrepreneurs will emerge to reap the benefits of greater trade and investment within the region—driven more by business considerations than by political concerns (World Bank 2009).

Innovation and entrepreneurship are at the core of the change process (Andersson and Djeflat 2013).

Putting in place the new type of development strategy and its various policy pillars requires a process that builds broad confidence and trust in the new model. This trust-building process—sometimes

TABLE I.1 The four pillars of the knowledge economy

<table>
<thead>
<tr>
<th>Economic and institutional regime</th>
<th>Education and skills</th>
<th>Innovation system</th>
<th>Information and communication infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>The country’s economic and institutional regime must provide incentives for the efficient use of existing knowledge, the acquisition of new knowledge, and the application of both to economic activity—to improve productivity, to raise quality, to innovate, and to launch new enterprises.</td>
<td>The country’s people need education and skills that enable them to create and share knowledge and to use it well.</td>
<td>The country’s information system—firms, research centers, universities, think tanks, consultants, and other organizations—must be capable of tapping the growing stock of global knowledge, assimilating and adapting it to local needs, and creating new technology that underpins the development of new products and processes that can compete in export markets and meet needs at home.</td>
<td>A dynamic information infrastructure is needed to facilitate the effective communication, dissemination, and processing of information.</td>
</tr>
</tbody>
</table>
How is a country’s preparedness for the knowledge economy measured?

The four-pillar framework highlighted above can also be used to measure countries’ efforts in the global knowledge economy and to shed light on their relative progress over time. The World Bank’s Knowledge Assessment Methodology (KAM, www.worldbank.org/kam) is a global Web-based tool that provides a basic assessment of countries’ and regions’ readiness for the knowledge economy. Countries’ efforts and investments in the knowledge economy are continuous—like a river’s flow—and all countries make these efforts. But the efforts in some countries flow more quickly than in others. The KAM tries to capture these differences in speed and monitor countries from a global perspective, charting their progress on the four pillars and on combined indexes.

The KAM compares 146 countries on the basis of 148 structural and qualitative variables that serve as proxies for the four knowledge economy pillars. The basic scorecard consists of three key variables that serve as proxies for each of the pillars described in table 1. The Knowledge Economy index (KEI) measures the overall preparedness of a country or a region for the knowledge economy. It is based on the average of all normalized scores on the four pillars of the knowledge economy.

The figure below provides a snapshot of MENA’s most recent performance on the four knowledge economy pillars in comparison with two other world regions: Europe and Central Asia, and Latin America and the Caribbean (LAC). The figure reveals that the MENA region as a whole could do more to harness the benefits of knowledge for growth and economic diversification.

The region’s knowledge economy performance in comparative perspective, 2012


Note: Owing to a lack of data for the MENA region as a whole, the variables on tariff and nontariff barriers (parts of the basic KAM scorecard) have not been included in the figure above.

Diversification initiatives

<table>
<thead>
<tr>
<th>Growth sectors</th>
<th>Innovation sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop new sectors such as information technology services, creative industries, health tourism, and green technologies by exploiting specific niches and the country’s comparative advantages. Improve established sectors such as agrifood industries and petrochemicals by strengthening value chains.</td>
<td>Develop technoparks, industrial clusters, and dynamic economic zones. Build new cities and global innovation spots. Reduce territorial disparities within the country by building knowledge infrastructure, improving the business environment, and stimulating innovation in depleted areas.</td>
</tr>
</tbody>
</table>
Introduction

referred to in this report as the fifth pillar of the knowledge economy—requires bold and broad social approaches. The new economic model should be accompanied by a new social contract between ruling powers and citizens, a contract in which key reforms are accepted in return for the promise of significant growth and employment. Leaders in the Arab world can use the impetus toward greater openness, democracy, and justice to begin the transition to a knowledge-based economy. In the establishment of the new economic model, leaders should take the opportunity to engage change agents—young people, entrepreneurs, and the new class of workers known as “knowledge workers,” who form the foundations of the knowledge economy and society. The process of engagement should include (i) the participation of those change agents in the design of plans and reforms, (ii) the involvement of local leaders in the context of thoughtful decentralization initiatives, and (iii) the development of financial incentives to raise competences, encourage entrepreneurship, and reward entrepreneurial success. To gain acceptance, a bold approach must also be pragmatic—that is, it should generate visible results by capitalizing on immediate opportunities to create jobs and stimulate new economic activity. These opportunities lie precisely in the growth sectors and sites that are the sources of economic diversification. The “how to” of the new development strategies is key for their success.

In light of the region’s recent and continuing reforms and its ambitions to realize faster growth, it is important for each country’s leaders and interested stakeholders to evaluate where they stand along their journey and how they can take maximum advantage of other countries’ experiences in using knowledge and innovation for growth and employment. Singapore, Finland, South Korea, and other success stories of our time advanced by forging a consensus on economic direction, by constantly learning from global developments (and their by-product, innovation), and by harnessing the power of urban networks and creative cities (which are the main loci of change and transformation in the global economy). It is important to remain open to such experiences and to learn from them, in view of the dynamism of these economies on the global stage as sources of knowledge, technology, investment, and markets.

Several countries in the Arab world are already taking strides in this direction and paving the way for their transition from factor-driven to more knowledge- and innovation-driven economies (box I.5).

The success of the new development strategies will be enhanced by active processes of integration within the Arab world, as well as in the Mediterranean area. Regional integration within the Euro-Mediterranean space should take concrete form through new agreements to facilitate trade, foreign direct investment (FDI), and outsourcing, as well as new projects to transfer innovation and technology, and new networks in research and education. The clear engagement of the international community will be essential if opportunities for synergy and mutual reinforcement of growth potential are to be fully realized.

Getting started. Given the immense challenges and opportunities, what should policy makers in the region do? How should governments reform their overall business and regulatory environments? How can entire educational systems be reformed to produce people with the skills the market needs? How can they support innovation in all its forms—from the creation of new technology that is embedded in new products and processes to the diffusion and use of existing technology? How can governments promote cheaper and more reliable connectivity and develop an entrepreneurial and competitive workforce? What sectors are likely to be the best new sources of growth and employment? What are the best ways to stimulate new sites—such as secondary cities and other clusters outside the capital or dominant region of the country—to serve as sources of innovation and growth, to reduce territorial disparities, and to prevent excessive urban concentration? And, above all, how can the entrepreneurial and innovative dynamism that is burgeoning in many corners of the Arab world (The Economist 2012) be harnessed?

This report highlights some policy areas that will need attention if countries are to fully embrace the knowledge economy. The value added of this work stems from the integrative nature of the knowledge economy approach, which can help MENA countries reexamine their development strategies in a coordinated manner, rather than through national and sectoral strategies that are prepared and then implemented in isolation. This study builds on the wealth of work done on the region—analytical and flagship reports, as well as capacity-building efforts—by the World Bank and other international organizations, and by the countries themselves. It is also focused on the practicalities of how to move forward by adapting the knowledge framework to country specificities in the region.

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1. At the center of the knowledge economy are what Peter Drucker refers to as “knowledge workers”—people with considerable theoretical knowledge and learning, such as doctors, lawyers, teachers, accountants, and engineers. But the most striking growth will be in so-called knowledge technologists. This class of workers includes computer technicians, software designers, analysts in clinical labs, manufacturing technologists, and paralegals, who spend far more time working with their hands than with their brains, but whose manual work is based on a substantial amount of theoretical knowledge that can be acquired only through formal education, not apprenticeship. Just as unskilled manual workers in manufacturing were the dominant social and political force in the 20th century, knowledge technologists are likely to become the dominant social and perhaps political force in the next decades (Drucker 2001).
A road partly traveled

In Algeria the Conseil national économique et social (CNES) has organized national conferences on the knowledge economy to raise awareness of key issues. Government authorities have undertaken reforms in the information and communication technology (ICT) sector and initiated the development of technology parks.

Jordan has embarked on a major effort to transform the education system at the early childhood, basic, and secondary levels to produce graduates with the skills needed for the knowledge economy. It has taken steps to become a regional center of ICT development, including partnerships with Microsoft and Cisco, to provide more attractive job opportunities for highly skilled young graduates. In the past few years, it has acted to improve the innovation climate through the creation of a National Council for Competitiveness and Innovation. It has also embarked on the formulation of its 2012–16 science, technology and industry strategy.

The Kingdom of Saudi Arabia has embarked on a strategy to move to a knowledge economy by 2022 and has put in place a host of education reforms. It is also investing in the development of new universities, especially to boost science and technology, and has embarked on a major plan to transform the holy city of al-Madina into a knowledge city. This concept is designed to position the country in knowledge-based industries and to attract and develop talent from around the world.

Lebanon is moving on the innovation front. In 2011 the government requested World Bank support for a project to support innovative activities within the private sector. The proposed work could include a pilot investment fund to provide a combination of cash and equity financing to foster innovative ideas and support start-ups and other firms in the early stages of growth.

Morocco pioneered regulatory reforms in ICT and GSM systems in the late 1990s, making it one of the countries with the highest teledensity in the region. It also initiated the building of a number of technoparks and technological industrial zones that attracted FDI and advanced manufacturing operations. It has developed a series of national plans in several domains—agriculture, fisheries, industry, ICT, tourism, and education—directly inspired by a will to follow a knowledge-based development path.

In Oman, a combination of pro-employment policies, access to land ownership, facilitation of affordable consumer products, and freely available all-encompassing health and education services has supported improved living conditions. A research council has been instituted as part of a policy to give high priority to research and innovation, including the initiation of open research grants.

Qatar has endeavored to enlarge its development model from one based solely on oil and natural gas to a model oriented toward the knowledge-based economy. An education reform law passed in 2001 attempted to break the mold of the rote memorization system, and the development of Education City by the Qatar Foundation for Education, Science, and Community Development is aimed at making Doha the center of educational excellence in the Middle East. Doha has already hosted international meetings on politics and economics and is becoming a world-renowned center for Islamic art and culture.

Tunisia, following the preparation and publication of knowledge-economy annual reports, developed a comprehensive knowledge-economy strategy as part of its five-year plans to cope with high unemployment, especially among youth. It has established a series of technopoles throughout the country to renew and expand its economic base. Tunisia’s development plan for 2011–14 goes further in articulating a growth path driven by knowledge and innovation.

In the United Arab Emirates (UAE), Dubai has based its development over two decades on a clear knowledge and innovation strategy. Its strategy of building a transport and logistics hub (centered on a world-class port) has spawned a successful tourism industry. In addition, the UAE has developed core competencies in technology, media, and telecommunications.

These examples were shared at the 2009 Knowledge Economy Conference, held under the auspices of ISESCO and the Government of Tunisia, with World Bank support. The conference produced the Tunis Declaration: http://info.worldbank.org/etools/docs/library/252535/TunisKEDeclaration.pdf.

Source: Authors.
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Key issues: Why, what, and how?

In this part

- Chapter 1. Deploying knowledge and innovation to transform Arab economies
- Chapter 2. Catching up with global knowledge-economy trends
- Chapter 3. Shaping new development strategies for Arab countries
Chapter 1
Deploying knowledge and innovation to transform Arab economies

This chapter highlights the main challenges facing the Arab world as it enters a new phase in its history, a phase that millions hope will be characterized by broad-based, inclusive development. The events triggered by the Arab Spring have shown the vital importance of rethinking national development strategies and building a new economic model that will foster new jobs and free, just, and dynamic societies. An approach to development founded on knowledge offers clear opportunities to achieve that vision. Because job creation is undeniably the main challenge facing most Arab countries, the last part of this chapter examines the links between investments in knowledge, long-term economic growth, and employment.1

A host of daunting challenges

The Arab world comprises a diverse set of countries with very different characteristics. In the countries of the Gulf Cooperation Council (GCC)—Saudi Arabia, the United Arab Emirates, Bahrain, Kuwait, Qatar, and Oman—a large share of households enjoy a high level of disposable income. Elsewhere in the Middle East and North Africa (MENA), countries have yet to develop a sizable middle class capable of exercising significant consumer-spending power. Even so, by international standards, poverty is low in Arab countries. The percentage of the poor in MENA, measured at the $1.25-a-day poverty line, was as low as 2.7 percent in 2008. In the same year, about 14 percent of the region’s population lived below the $2-a-day poverty line (World Bank 2012a). But there is substantial variation in living standards within the region. In Djibouti and Yemen, for example, a third or more of the population lives on less than $2 a day (World Bank 2012a).

Although growth had accelerated in Arab countries before the political upheavals of 2011, the region still exhibited structural deficiencies that caused widespread feelings of exclusion and the perception that opportunities were unequal. Between 2000 and 2009, economic growth averaged more than 4 percent (FEMISE 2011) but still lagged behind the developing-country average of 7.2 percent. The economies of the region still have not converged with neighboring European economies (figure 1.1). Resource-rich countries remain in dire need of greater economic diversification, while the ability of non-oil-producing countries to provide equal access to economic opportunities to their citizens is limited. The Arab Spring highlighted the weaknesses of the region’s development pattern, which has failed to absorb the growing numbers of young people entering the labor force. In general, the region has lacked an inclusive growth strategy and generated inefficient social policies. Widespread corruption and weak institutions have prevented an equal distribution of economic gains. Indeed, the alliance between the state and a privileged rent-seeking business elite was seen as an important driver of the Arab Spring.

Unemployment, in particular among young people, is incontestably the main challenge facing Arab countries. The MENA region has the highest rate of youth unemployment in the world—25 percent—twice the world average (figure 1.2; see also figure 1.3). Already a pressing issue before the revolutions of 2011, creating jobs is now the top priority as countries confront an economic downturn (owing to both global and local factors) and try to respond to acute societal demands. Educated Arab youth are clamoring for opportunities—if jobs are not created, further instability is likely. Unfortunately, high rates of demographic growth (averaging around 1.5 percent) and the associated swelling of the labor force already weigh heavily on the job market (figure 1.4).

Arab countries have been unsuccessful in developing a strong and competitive private sector that generates productive employment. Although the formal private sector plays a larger role in the region’s economies than it once did, it still falls short of being the engine of strong growth. Poor productivity and low rates of innovation have restrained firm competitiveness and the diversification of exports. Private investment has stagnated at less than 15 percent of GDP, insufficient to create the necessary jobs (figure 1.5). Foreign investment had picked up significantly before the current downturn, but it was concentrated in energy, infrastructure, and real estate, with little investment in technology-intensive ventures. A large part of the problem

1. This chapter builds on background contributions by Chen, Diop, and Muller (2012) and Zeidane (2012).
2. This study covers all members of the Arab League, with the exception of Comoros, Mauritania, Somalia, and Sudan. Reference is often made to the Middle East and North Africa (MENA) as a geographic region. According to the World Bank’s definition, the MENA region encompasses Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, West Bank and Gaza, and Yemen. Iran, Israel, and Malta are not covered by this study, as they are not Arab countries.
Chapter 1: Deploying knowledge and innovation to transform Arab economies

**FIGURE 1.1**
Lagging growth in the Arab world
GDP capita in world and selected regions, 1975–2011 (constant 2000 US$)

Source: World Bank data.

**FIGURE 1.2**
Youth unemployment by region, 2011 estimates (%)

Source: ILO 2012.

Note: CIS = Commonwealth of Independent States; EU = European Union.

**FIGURE 1.3**
MENA unemployment by age, various years

Source: Gatti and others 2013.

Note: MENA = Middle East and North Africa; UAE = United Arab Emirates; WBG = West Bank and Gaza.
Chapter 1: Deploying knowledge and innovation to transform Arab economies

with private sector development seems to lie with public-private relations, which have historically been characterized by mutual mistrust. When asked about obstacles to business expansion, investors in Arab countries—especially managers of small- and medium-sized firms—consistently point to policy uncertainty and an uneven playing field that favors incumbent firms at the expense of new entrants and competitors. At the same time, many public officials are skeptical about the ability of the private sector to deliver growth and critical of its rent-seeking behavior (World Bank 2009).

The cause of both corruption and policy uncertainty is the same: weak governance structures characterized by a lack of voice, participation, and accountability (see chapter 4). In many Arab countries, decision-making power is concentrated at a very high level. Irregular and exclusive consultations between the public and private sectors leave most of the business community out of the policy process. In the absence of strong parliaments and a truly independent judiciary, checks and balances are a rarity in most Arab countries, muting citizens’ voices and leaving ruling elites unaccountable. In Tunisia and elsewhere, popular perceptions of powerlessness and unaccountability led to demands for the dignity of full civic rights and renegotiation of the social contract based on modern governance principles and inclusion (CMI, World Bank, and IsDB 2012).

Weaknesses in governance structures also affect social protection. In most MENA countries, two out of three people in the poorest quintile do not receive income support. Social protection systems have frayed under the strain of poor resource management. Subsidies represent a significant proportion of GDP and consist mainly of energy subsidies. But the rich tend to receive a larger share of

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**Figure 1.4**
Population growth in MENA by age group, 1980–2050


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**Figure 1.5**
Private investment as a share of GDP in world regions, 1990s vs. 2000s


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3. Estimates suggest consumer subsidies are more than 5 percent of GDP in Egypt, Yemen, Kuwait, and Algeria (World Bank internal document).
consumption subsidies in absolute terms than the poor. Gaps in coverage also leave informal and rural workers without protection [FEMISE 2011].

**Social inequity is further exacerbated by acute regional disparities.** Lagging regions are particularly vulnerable to poverty. The highest poverty in Egypt is concentrated in Upper Egypt, where 44 percent of the rural population was living in poverty in 2009 and where 95 percent of Egypt’s poorest villages are located. In Tunisia, urban-rural disparities are stark. Coastal cities generate 85 percent of the country’s gross domestic product (GDP); maternal mortality rates are three times higher in rural areas (70 versus 20 deaths per 100,000 live births, respectively); less than 60 percent of the rural population has access to safe drinking water and 40 percent has access to modern sanitation (compared to near universal access in urban areas).

**Marked gender inequalities remain a critical concern.** Significant improvements have been made in female school enrollment rates and in women’s life expectancy, but gender equality remains elusive. Perhaps the most important aspect of gender inequality is the very low rate at which the region’s women participate in the labor force (figure 1.6). In fact that rate is the lowest in the world: only one in four working-age women are in the labor market, and an average of 20 percent of them are unemployed [European Commission 2010].

**Food security was an important issue during the Arab Spring and remains an important concern for the poorest households of the region.** Cereal productivity in the MENA region is approximately half that of the rest of the world (1.5 versus 3 metric tons per hectare). Yet, 40–60 percent of irrigated land is dedicated to growing cereals. MENA countries underinvest in agricultural productivity, with only 0.66 percent of aggregate GDP in agricultural research and development compared to 2.36 percent in developed countries. The region imports 30 percent of the world’s traded wheat, a figure that is expected to rise to 55 percent by 2030. Rapidly growing populations and the limited availability of water and arable land mean that MENA countries are more dependent than most world regions on international food commodity markets and particularly vulnerable to rising food prices, which fall hardest on the region’s poor, who spend 35–65 percent of their income on food [Akhtar 2011].

**Urbanization and climate change will pose additional social challenges.** Already, 58 percent of the MENA region’s population resides in urban areas [World Bank 2012b], and that figure is expected to reach over 65 percent by 2030 [United Nations 2007]. The issue is no longer how to stop urbanization but how to manage it to exploit the growth-enhancing benefits of agglomeration while minimizing environmental damage and threats to public health from pollution, poor sanitation, and other causes. Over many years, unplanned urban growth and the expansion of informal settlements have produced metropolitan areas that cannot provide basic services—including public transportation, safe water, and adequate sanitation—to their residents. MENA is already the world’s driest region; with population growth, per capita water availability is predicted to shrink by half by 2050, even before accounting for the effects of climate change, which is likely to aggravate water scarcity [World Bank 2010b]. Because agriculture accounts for 85 percent of the region’s water use, increased water scarcity resulting from climate change will pose a grave threat to food security. Fluctuations in agricultural yields are expected to increase, ultimately falling to a significantly lower long-term average [World Bank 2010b]. Climate change also is expected to amplify the burden of water-related, cardio-respiratory, and vector-borne diseases through a variety of pathways. Finally, Arab countries are significantly vulnerable to any rise in sea level, which could quickly expose millions of people to coastal flooding.

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**Figure 1.6**

**Female labor participation rates**

Source: Gatti and others 2013.

Note: LAC = Latin America and the Caribbean; OECD = Organisation for Economic Co-operation and Development; EU = European Union.
Chapter 1: Deploying knowledge and innovation to transform Arab economies

Wanted: A new economic model

Before the Arab Spring, several Arab countries had revisited their growth and development strategies (see the introduction to this volume), but the need for a new economic model is now broadly perceived. It is now widely recognized that the challenges described above are closely interconnected and require an integrated approach. The enhanced attention to job issues offers an opportunity to develop innovative, inclusive, and coordinated strategies. The ineffectiveness of youth employment policies to date makes it clear that only integrated strategies will allow Arab countries not only to respond to the job challenge but also to improve social cohesion, which is the foundation of continued economic and social development (FEMISE 2011). As highlighted during the Arab Spring, the pace and the nature of job creation can affect social cohesion in many ways, notably by raising or lowering levels of equity, citizens’ trust in institutions, and their willingness to participate in civil society (World Bank forthcoming 2013). Recognizing and acting on the vital nexus between the environment and the economy is also key to meeting the challenges facing Arab countries. By mainstreaming the environment in economic policies and promoting green growth at the national and regional levels, countries can foster economic growth, create jobs, and manage natural resources sustainably (CMI, World Bank, and IsDB 2012). But moving toward such an integrated strategy requires a comprehensive set of policies and close partnerships between public and private stakeholders.

The Arab Spring has opened up opportunities to build new coalitions for change. Although Arab countries differ widely in their political systems and practices, many governments now feel the need to adjust and redefine the rules of the game. The business community, historically not inclined to support reforms, may now be easing its claim to privileged access to markets and investments. A stronger role will also be played by civil society, in expressing the newly empowered voice of citizens. These new agents of change will be called upon to support significant governance reforms that will allow the planning, implementation, and evaluation of an integrated strategy aimed at creating more and better jobs.

A new economic model, based on knowledge and innovation, could respond directly and simultaneously to the aforementioned challenges. The dynamic process of knowledge and wealth creation raises tremendous possibilities for enhancing growth and competitiveness. But there is also a risk that countries or firms and organizations that are not able to keep pace with rapid change will fall behind. Most oil-importing countries in MENA are middle-income countries that have achieved universal basic education and are poised to realize faster growth. The oil exporters are now grappling with the transition from an oil-based to a knowledge-based economy to create meaningful employment opportunities for their youthful populations and prepare for a day when their fossil fuel endowments are depleted. All these countries need to formulate a robust national knowledge economy strategy and reform the appropriate sectors in order to achieve this growth.

Arab countries face a challenging international context characterized by a major economic downturn and growing pressure to raise productivity and competitiveness. The current economic crisis affecting the euro zone, the major trade partner of the MENA countries, represents a serious constraint for the region’s growth prospects. Countries such as China and India have become the main drivers of global trade, putting pressure on firms in other developing countries to improve productivity and cut costs, as well as making it more difficult to attract foreign direct investment (FDI). Global value chains have become more elaborate over the past 10 to 15 years, and entering them now requires considerable competence on the part of suppliers. MENA countries, however, continue to depend on a small number of exports—mainly natural resources and products requiring very little transformation (CMI, World Bank, and IsDB 2012). In this context, it will be difficult for the MENA countries to base their growth strategy solely on exports, as the East Asian economies did; it will therefore be necessary to develop domestic markets alongside export markets. Yet, Arab countries also must achieve greater diversification of their economies and improve their international competitiveness, particularly as rapidly growing trade in services could well result in a massive international migration of white-collar jobs, amplifying the risk of a global competition for jobs, especially good ones (World Bank 2013).

Raising productivity will require further investment in knowledge and innovation, one of the most important determinants of change in total factor productivity (TFP). As discussed in the introduction, TFP is a residual variable that expresses the effects on output of factors other than the traditional production inputs (labor and capital). It is considered a measure of an economy’s long-term technological change (through technological growth or changes in efficiency). Many studies have shown that, over the past few decades, TFP in the Arab world has grown very slowly. Using empirical analyses based on endogenous growth models, Isaksson (2007) found that between 1960 and 2000 MENA had the second-lowest level of TFP growth after Sub-Saharan Africa. The region’s annual rate of TFP growth was 0.08 percent, compared with 0.6 percent for the East Asian “Tigers.” These empirical findings echo the results of a study by Makdisi, Fattah, and Limami (2007) that showed that the main sources of growth in MENA were not related to knowledge (technological growth and increase in technical efficiency) but rather to growth in capital and labor in the economy, notably in most of the GCC countries (figure 1.7).

Mismatches between productive structures and the supply of skills will need to be reduced. The productive structure of Arab countries, however, shows low demand for highly skilled labor, while the education system produces growing numbers of university students. The model used in these works is a Cobb-Douglas production function: \( Y = A K^{\alpha} L^{1-\alpha} \), where \( A \) represents TFP, \( K \) physical capital, \( H \) human capital determined by a relation of the type \( H = \beta L, educ \), and \( \alpha \) the relative share of physical capital in production. Once this share is determined, the annual variation in TFP appears as a residual.
graduates. Indeed, education levels in the region have increased significantly since 2002 (figure 1.8). The aspirations of young people are rising with their level of education. Beyond fomenting social discontent, this situation is harmful for at least two reasons: (i) a substantial share of the region’s human capital is not being used for productive purposes; and (ii) persistent unemployment among graduates may discourage future generations from investing in education.

Reducing unemployment will therefore require that Arab countries move toward productive activities with higher value-added and improve their education and training systems. The high rate of unemployment among young graduates can be traced to the mismatch between the skills with which they leave the educational system and those needed by the economy. One solution, desirable for more than one reason, would be to nudge the economy to increase its demand for skills. To do that, the

![Figure 1.7](image1.png)

*Figure 1.7 Average annual rates of TFP growth, 1990–2009*

Source: CMI calculations based on Total Economy Database (2012).

Source: TFP = total factor productivity. Although Qatar and the United Arab Emirates (UAE) have similar scores on the World Bank’s Knowledge Economy Index, Qatar had much higher average rates of TFP growth. The difference can be explained by the greater sensitivity of UAE’s TFP growth to the global financial crises of 1997 and 2007.

![Figure 1.8](image2.png)

*Figure 1.8 Postsecondary enrollment in MENA, 2002–10*

Source: CMI calculations based on UNESCO data.

Note: MENA = Middle East and North Africa; GCC = Gulf Cooperation Council.
productive system must raise its technology content, the quality of its production, and its place in the value chain—that is, it must concentrate on generating products with greater value-added (FEMISE 2011). Another source of the skills mismatch that afflicts the labor market in most Arab countries is the generalist orientation of postsecondary training at the expense of technical and scientific training. Overall, the quality of education in the region is quite low, and firms complain regularly about the lack of skills presented by job seekers (World Bank 2010a). A knowledge-based development strategy will therefore require structural policies that address both the labor-demand side, through the development of a formal private sector that favors the emergence of high-value-added activities, and the labor-supply side, through better-targeted education policies.

**Higher productivity and better training will also help address widespread informal employment and its associated social costs.** In the MENA and GCC countries, 81 percent of the working-age population work in the informal economy (figure 1.9). This means that more than two-thirds of all workers in the region may not have access to health insurance and are not contributing to a pension system that will provide them with income security after retirement. A typical country in the MENA region produces about one-third of its GDP in the informal economy. From a fiscal perspective, about one-third of total economic output in the region remains undeclared and therefore untaxed, with considerable implications for government revenue. The low productivity of informal work is especially notable in MENA’s poorer countries and rural areas, where workers with limited literacy and education are engaged in micro-entrepreneurship and low-yield agricultural work. For that reason, programs aimed at increasing productivity in the informal sector through training and skills upgrading will be essential components of any knowledge economy approach that hopes to promote inclusive growth in the long term. The high prevalence of informality also implies that a vast majority of economic agents operate outside the realm of regulation. Supporting their transition to formal employment will mean that those outsiders (including the unemployed, youth, women, and informal workers) will be better represented in the social dialogue (World Bank 2011b).

**Knowledge and innovation must be part of any strategy aimed at easing the pressure on physical resources and the challenges of climate change.** Water scarcity and environmental degradation threaten key economic sectors such as tourism and disproportionately affect the poorest households of the region’s population. To address those threats and raise the productivity of natural assets (especially water), technology diffusion and innovation efforts will be required (CMI, World Bank, and IsDB 2012). That requirement is both an imperative and an opportunity for the region, where green energy remains underdeveloped, despite its huge growth potential. Opportunities include energy efficiency in the construction, transport, and waste management sectors, as well as renewable energy. The region’s vast solar energy potential also offers opportunities for growth, employment, and net exports. Taking advantage of this sector will require massive investments in skills, research and development (R&D), and clustering (CMI, World Bank, and IsDB 2012). Investing in green growth strategies could also contribute significantly to job creation in the region (CMI 2012).

![FIGURE 1.9](source: MNSHD [UN population data and Key Indicators of the Labour Market, International Labour Organization])

**The knowledge economy, growth, and employment**

Heavy investment in the knowledge economy is associated with reduced unemployment. Because economic growth and job creation is the main challenge to be addressed by any development strategy built around the cultivation of a knowledge economy, it is important to examine to what extent efforts to stimulate the knowledge economy can contribute to economic growth and employment. From an examination of the recent evolution of the MENA region, it does appear that high investment in components of the knowledge economy, as measured by the Knowledge Economy Index (KEI), are associated with reduced unemployment (figure 1.10).

**The mechanisms by which the knowledge economy boosts economic growth are theoretically and empirically well founded.** In the long run there is no question about the effects of the knowledge economy on economic growth through productivity growth (box 1.1). It also tends to boost employment of skilled labor. Whether that boost is enough to reduce unemployment depends on a host of factors, chief among them the skill profile of job seekers.

**A model built on the scheme illustrated in figure 1.11 uses the KEI to measure countries’ knowledge effort.** The model, described in detail in annex 1, has made it possible to estimate with some precision the contribution of knowledge economy efforts to growth and to employment in the MENA countries in the period between 1995 and 2008, with two subperiods: 1995–99
Chapter 1: Deploying knowledge and innovation to transform Arab economies

In the model, the elasticity of employment to increases in knowledge investments in a given country is mediated by the elasticity of employment to growth in that country.

The impacts of a knowledge economy effort in the first year of each period are assumed to spread over the rest of the period. The effects of knowledge on growth are measured for the periods 1995–2000 and 2001–05, whereas the elasticity of employment to growth is measured for the periods 1991–99 and 2000–09. The effects of knowledge on employment are the product of these two coefficients. See annex 1 for the full analysis.

5. The impacts of a knowledge economy effort in the first year of each period are assumed to spread over the rest of the period. The effects of knowledge on growth are measured for the periods 1995–2000 and 2001–05, whereas the elasticity of employment to growth is measured for the periods 1991–99 and 2000–09. The effects of knowledge on employment are the product of these two coefficients. See annex 1 for the full analysis.
Investment in knowledge indisputably encourages long-term growth. According to the so-called new growth models (Romer 1993), investment in knowledge helps generate new ideas and processes that make possible new products and production processes. Since the pioneering work of Schumpeter, this has been called innovation. Even if the immediate results of innovation are patented, copyrighted, or otherwise appropriated by the innovators, new ideas always entail positive externalities that can be captured by individuals, firms, and industries capable of absorbing them, with the result that innovation’s benefits for society are greater than the private benefit captured by innovators. In other words, when entrepreneurs innovate, countries can grow permanently, despite diminishing returns to capital and labor. In today’s global market, innovation is a condition for increasing market shares for many products. Around 60 percent of export growth now takes place through the introduction of new product varieties, rather than by exporting higher volumes of the same goods (see empirical analysis by Hummels and Klenow 2005).

There is empirical evidence of a strong positive relationship between the knowledge economy and economic growth in both developed and developing countries (Chen and Dahlin 2004; Poorfaraj, Samimi, and Keshvarz 2011). Their assessment of 92 countries for the period between 1960 and 2000 shows that knowledge is a significant determinant of long-term economic growth through its effects on the growth rate of total factor productivity (TFP). In particular, they find that the stock of human capital, the level of domestic innovation and technological adaptation, and the level of information and communications infrastructure all exert statistically significant positive effects on long-term economic growth.

Openness to trade is a major mediator of the relationship between knowledge and growth. Innovation is a near impossibility in a closed economy. By contrast, trade integration is a powerful way of tapping into global knowledge through foreign direct investment and access to technology, whether licensed or purchased. There is abundant empirical evidence that cheap access to equipment and machinery has a positive impact on TFP and thus growth. For instance, Coe and Helpman (1995) and Coe, Helpman, and Hoffmaister (1997) find that foreign knowledge conveyed through trade in goods has a statistically significant positive impact on aggregate TFP in importing countries. Schiff and Wang (2007) show that the impact grows with increased trade with industrial countries, reflecting the fact that about 80 percent of the world’s research and development occurs in the developed world.

The impact of knowledge-based growth on employment depends mainly on the skill profiles of job seekers. The positive impact of higher growth on demand for labor is undisputed. Generally, moving to a knowledge-based economy leads to an increase in demand for highly skilled workers and, under most circumstances, higher wages for such workers. But higher demand for labor will reduce unemployment only if the unemployed are qualified for the new jobs. Much depends on the sectoral basis of growth, the propensity of sectors to hire labor as they grow, and the profile of job seekers in the economy. The empirical literature corroborates these theoretical intuitions. Studies show a strong positive relationship between the introduction of knowledge-intensive means of production, such as those based on information technologies, and demand for highly skilled workers (see OECD 2004 for a summary). But if most unemployed workers are unskilled, overall unemployment may not decline.

A tendency for the labor market to polarize and for the wage gap to widen has also been noted in studies conducted on developed countries (OECD 2004). In the United States, relative wages for less-skilled workers have declined, even as the overall unemployment rate remained low. The United Kingdom was marked by a similar growing wage gap between skilled and unskilled workers. The other major European countries have seen no polarization in terms of wages, but the rate of unemployment for unskilled workers has risen. Knowledge and technological change are not the only drivers of these outcomes, however. Globalization affects the wage differential, regardless of changes in technologies.

Source: Chen, Diop, and Muller 2012.

a. Schumpeter defines innovation as consisting of (i) new products and services, (ii) new processes, (iii) new ways to penetrate new markets, (iv) new supply sources or distribution methods, and (v) new industries (Schumpeter 1912/1961).

b. Economic theory emphasizes education and human capital as preconditions for absorbing new ideas and building a knowledge economy. Indeed, the availability of high-quality and abundant human capital allows the economy to absorb new ideas and avoids the problem of diminishing returns to capital and labor (Lucas 1988).

c. The traditional models postulate that the growth rate of technology (or technological development) was exogenous.

But the knowledge contribution has not been sufficient to significantly reduce unemployment, except in the small economies of the Gulf. There are three reasons for this:

- The knowledge economy effort, although of proven value, has been insufficient. In general the MENA countries have performed below the world average in terms of the effort they have devoted to developing the knowledge economy, as discussed in the next chapter.
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**FIGURE 1.12**
Elasticity of employment to economic growth in MENA countries, 1995–2008

![Graph showing elasticity of employment to economic growth in MENA countries, 1995–2008](image)

*coefficient is not statistically significant

Source: Authors.
Note: MENA = Middle East and North Africa.

**FIGURE 1.13**
Elasticity of employment to the KEI in MENA countries, 1995–2008

![Graph showing elasticity of employment to the KEI in MENA countries, 1995–2008](image)

Source: Authors.
Note: KEI = Knowledge Economy Index; MENA = Middle East and North Africa.
In most countries there is a wide mismatch between the skills demanded by employers and those presented by job seekers [see chapter 5]. That mismatch attenuates the positive adjustment of employment to increases in the KEI. Where the labor force has the requisite skills, as in Qatar (thanks to the easy attraction of skilled expatriates), investments in the knowledge economy have a huge impact on jobs. Most MENA countries have an abundance of highly educated workers, but their skills are not adapted to the demands of the economy.

Economic structures mediate the effect of higher growth on jobs, particularly skilled jobs. In most MENA countries, owing to a lack of competitiveness, growth has a limited effect on employment (that is, the elasticity of employment to economic growth is limited) in most sectors exposed to foreign competition. The main provider of skilled jobs in the region has been government, as illustrated by the case of Tunisia in figure 1.14.

Future efforts to spur development of the knowledge economy can contribute to economic growth and employment creation through three channels:

- **More and better knowledge economy efforts.** To have a serious impact, knowledge economy efforts should be significant, as shown by the results given above. Raising a country’s KEI even by one unit is a tall order. It is equivalent to gaining about 15 ranks in the KEI. But this degree of progress is possible with a sustained effort. Several years are typically required, as variables related to education and innovation do not move up quickly (unlike those related to the business environment and information and communication technology, where progress can be rapid).

- **Reducing the skills mismatch.** Major adjustments are needed in the education and training systems of the region to ensure a better fit between graduates’ skills and the demands of employers. In the meantime, short-term measures to retrain workers or provide them additional education in response to clearly identified labor demands can have an important impact on reducing the gap in skills-related supply and demand.

- **Steering economies toward more competitive sectors** in which growth is more likely to create jobs (that is, where the elasticity of skilled employment to economic growth is higher). This, too, is a difficult task in a world where manufacturing is dominated by Asian countries and where demand has been stifled by recession. But opportunities exist in non-traded goods and services, in sectors in which the MENA countries possess unique comparative advantages owing to geography or other factors, and in environment- and infrastructure-related activities.

### TABLE 1.1 Employment growth rates in Arab countries, 2000–09

<table>
<thead>
<tr>
<th>Country name</th>
<th>2000</th>
<th>2009</th>
<th>Compounded annual rate of growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>7,772,217</td>
<td>13,195,310</td>
<td>6.06</td>
</tr>
<tr>
<td>Egypt, Arab Rep.</td>
<td>19,254,668</td>
<td>23,980,516</td>
<td>2.47</td>
</tr>
<tr>
<td>Libya</td>
<td>1,624,133</td>
<td>2,103,832</td>
<td>2.92</td>
</tr>
<tr>
<td>Morocco</td>
<td>8,819,170</td>
<td>10,758,452</td>
<td>2.23</td>
</tr>
<tr>
<td>Tunisia</td>
<td>2,711,153</td>
<td>3,271,820</td>
<td>2.11</td>
</tr>
<tr>
<td>Bahrain</td>
<td>200,000</td>
<td>400,000</td>
<td>8.01</td>
</tr>
<tr>
<td>Kuwait</td>
<td>1,200,000</td>
<td>2,100,000</td>
<td>6.42</td>
</tr>
<tr>
<td>Oman</td>
<td>700,000</td>
<td>1,100,000</td>
<td>5.15</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>6,000,000</td>
<td>8,100,000</td>
<td>3.39</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>1,700,000</td>
<td>3,500,000</td>
<td>8.35</td>
</tr>
<tr>
<td>Gulf Cooperation Council</td>
<td>9,800,000</td>
<td>15,200,000</td>
<td>5.00</td>
</tr>
<tr>
<td>Non-GCC</td>
<td>53,202,748</td>
<td>69,935,998</td>
<td>3.09</td>
</tr>
<tr>
<td>Total</td>
<td>63,002,748</td>
<td>85,135,998</td>
<td>3.40</td>
</tr>
</tbody>
</table>

Source: Authors.

Note: GCC = Gulf Cooperation Council.
**Conclusion**

*With sustained efforts, it should be possible within a reasonable period to increase significantly the current contribution of the knowledge economy to the growth of employment in the MENA region.*

Based on the estimates and figures provided above, one may reasonably expect a significant increase in the KEI effort across the region that could boost the annual rate of employment growth by 1 percentage point over the rate recorded in the decade 2000–09. Over a decade, such an increase in Tunisia would lead to some 300,000 new jobs, in Egypt to about 1.5 million new jobs, and in Saudi Arabia to some 700,000 new jobs (in addition to the jobs generated by pursuing current trends). Success in that endeavor would make a major contribution to shrinking the job problem, even if it would not eliminate it altogether. As will be seen in the next chapter, most Arab countries have some room to maneuver, because to date they have generally underinvested in the pillars of the knowledge economy by comparison with other countries at a similar level of development. Building a knowledge economy requires a sustained commitment, but it is the best choice for sustained economic growth with an appropriately high level of job creation.

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6. This period would vary from one country to the other. Five to ten years are generally necessary to see the benefits of efforts, reforms and initiatives in the different knowledge economy policy pillars.

7. The estimates offered here derive from the data presented above on the elasticity of employment to the KEI. For the period 2000–09, the region as a whole showed an elasticity of 0.7 percent for 15 positions in the KEI. That gain seems reasonable in view of the relative underinvestment of the region in the various knowledge economy pillars. In addition, one may presume a significant reduction in skill mismatches and an improve elasticity of employment to economic growth induced by improved competitiveness. Taking those factors into account, an increase of 1 percentage point in the annual growth rate of employment induced by more and better knowledge economy efforts is plausible.

8. It is generally estimated that a 7 percent economic growth rate is necessary for maintaining the level of employment in the region. An increased knowledge economy contribution would lower this requirement in a significant proportion. But at the same time, the overall growth rate is being negatively impacted by the global economic downturn, an effect that is likely to continue in the medium term.
References and bibliography


Chapter 1: Deploying knowledge and innovation to transform Arab economies


Chapter 2
Catching up with global knowledge economy trends

To create and sustain an effective knowledge economy in the medium to long run, the countries of the Arab world must understand their strengths and weaknesses in relation to the four pillars of the knowledge economy—the economic and institutional regime, education, innovation, and information and communication technologies (ICTs). They must then develop appropriate policies and investments as part of their national development plans, to enable an effective transition to the knowledge economy.¹

This chapter examines how the Arab region compares with other regions of the world in its readiness for the knowledge economy. To be useful, any assessment of the economic challenges facing the Middle East and North Africa (MENA) region must take into account the region’s great diversity.

The World Bank’s Knowledge Assessment Methodology (KAM) is a global benchmarking tool that makes it possible to examine the state of advancement of knowledge economies in countries and across regions. The 2012 KAM² treats MENA as a geographic region that includes 18 countries: Algeria, Bahrain, Djibouti, the Arab Republic of Egypt, the Islamic Republic of Iran, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic, Tunisia, the United Arab Emirates (UAE), and the Republic of Yemen. Iran, Israel, and Malta are not dealt with in this report because they are not Arab countries.

The Knowledge Economy Index (KEI) generated by the KAM measures the overall preparedness of a country or a region for the knowledge economy. It is based on the average of all normalized scores on the four pillars of the knowledge economy (as discussed in box 1.2 of the introduction). The higher the KEI score, the better prepared the country is to make an effective transition to the knowledge economy. Interestingly, country scores on the KEI can be mapped against the three-tier classification presented in the introduction.

The Knowledge Economy Index (KEI) generated by the KAM measures the overall preparedness of a country or a region for the knowledge economy. It is based on the average of all normalized scores on the four pillars of the knowledge economy (as discussed in box 1.2 of the introduction). The higher the KEI score, the better prepared the country is to make an effective transition to the knowledge economy. Interestingly, country scores on the KEI can be mapped against the three-tier classification presented in the introduction.

- Resource-rich, labor-abundant countries—such as Algeria, Syria, and Yemen—have low scores (and low rankings) on the KEI (Algeria is ranked 96, Syria 112, and Yemen 122). These countries have not yet been able to convert resource wealth into strong pillars of the knowledge economy.
- Resource-rich, labor-importing countries have relatively high scores (and rankings) on the KEI: the UAE is ranked 42, Bahrain 43, Oman 47, Saudi Arabia 50, Qatar 54, and Kuwait 64. These countries, many of which are small and have high per capita oil wealth, have started to use their natural resource wealth to begin a transformation to the knowledge economy.
- Resource-poor countries exhibit moderate performance on the KEI: Jordan is ranked 75, Tunisia 80, Lebanon 81, Egypt 97, and Morocco 102. They represent the typical spectrum of developing countries, where progress toward the knowledge economy depends on a wide range of factors.

The KAM helps shed light on how MENA fares on the global knowledge economy stage.³ Figure 2.1 provides a snapshot of MENA’s most recent performance on the four knowledge economy pillars as compared with two other world regions in the KAM: Europe and Central Asia (ECA) and Latin America and the Caribbean (LAC). It shows that the MENA region could do much more to harness the benefits of knowledge and innovation for growth and economic diversification, and in so doing, catch up with other regions of the world.

¹ This chapter draws on several references, including a background contribution by Koivisto (2012).
² The 2012 KAM (http://www.worldbank.org/kam) includes 148 structural and qualitative variables for 146 countries. It helps a country compare its readiness for the knowledge economy with its neighbors, competitors, or other countries that it wishes to emulate on the four pillars of the knowledge economy: the economic and institutional regime, education, innovation, and information and communication technologies (ICTs). The strength of the KAM is its cross-sectoral approach, which allows users to take a holistic view of a wide range of relevant factors, rather than focusing on just one pillar.
³ It should be noted that the KAM focuses on variables linked to knowledge and innovation performance but does not provide a broad picture of countries’ overall economic and social development. In contrast, the Economic and Social Development Indicator (ESDI), which was developed in 2010 through an initiative of the government of the Republic of Korea (NRCS 2010), aims to combine economic and social indicators to provide a better picture of balanced development. The motive underlying the ESDI initiative was a recognition that Korea’s development efforts had overemphasized growth, an imbalance that should be rectified through greater emphasis on social and environmental factors. The task was to create a new index to better reflect and measure Korea’s new policy goal of pursuing development that balances growth, social cohesion, and respect for the environment. The new indicator supports evidence-based policy making while also contributing to academic efforts to develop alternatives to gross domestic product (GDP) as measures of growth and development, a goal sought by several national governments and international organizations. The index consists of three main categories (growth engine, social cohesion, and the environment), each of which is further broken down and represented by standard measures. Reflecting Korea’s status as a member of the Organisation for Economic Co-operation and Development and a G20 country, the ESDI prototype included panel data from 38 countries over 20 years (1999–2009).
Chapter 2: Catching up with global knowledge economy trends

Figure 2.2 reveals that in 2012, the MENA region did better on the KEI than two other regions in the KAM: South Asia and Africa. MENA is almost at the level of LAC on the KEI, thanks to the progress made over the past 10 years in expanding access to education, acquiring and using ICTs, and gradually improving the institutional environment for private sector–led growth. But it still needs to do more to catch up with its ECA neighbors (to the north) and countries in East Asia and the Pacific (EAP), home to some of the world’s most dynamic economies.

Delving into the performance of countries across the region, the 2012 KAM shows that the KEI scores of most MENA countries have slipped since 2000, indicating a lack of progress in building knowledge economies (figure 2.3). Over the past decade, Algeria, Bahrain, Oman, Saudi Arabia, Tunisia, and the UAE—all resource-rich countries, except Tunisia—improved on the KEI, while Djibouti, Egypt, Jordan, Kuwait, Lebanon, Morocco, Qatar, Syria, and Yemen scored lower in 2012 than in 2000.

Like the KAM, the World Economic Forum’s (WEF’s) annual Global Competitiveness Index (GCI) helps to shed light on the performance of MENA countries. The GCI for 142 countries—including 14 from the MENA region—is presented in the 2011–12 Global Competitiveness Report (WEF 2011). Figure 2.4 compares the GCI rankings for countries in the Arab world in 2010 and 2011. The rankings of MENA countries are just as varied on the GCI as they are on the KEI. On the latest GCI, the Gulf Cooperation Council (GCC) countries in general did well. 4 Occupying position 14 in the global rankings, Qatar leads the region, followed by Saudi Arabia (17), the UAE (27), Oman (32), Kuwait (34), and Bahrain (37). Tunisia is in position 40 globally, the best of the non-resource-rich countries, thanks to its decision in the 1990s to pursue policies toward the development of a knowledge economy. Morocco is in position 73; Lebanon, 89; and Egypt, 94.

4 The Gulf Cooperation Council includes Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE. It should be noted that a good ranking on the KEI reflects strong investment in variables related to the knowledge economy, not necessarily good knowledge economy performance. Moreover, the KEI does not take into account social indicators, such as those related to gender, that may affect the long-term progress of societies.
Chapter 2: Catching up with global knowledge economy trends

On the GCI, as on the KEI, it is the resource-rich countries that lead the pack. Most Gulf economies have benefited from vast natural resources and rising energy prices, and have used the resulting revenues to improve their competitiveness in recent years by building solid foundations made up of a high-quality institutional framework, a stable macroeconomic environment, efficient goods markets, and increasingly sophisticated businesses. Others—among them Algeria, Egypt, Jordan, Lebanon, Morocco, Syria, and Tunisia, Morocco, Jordan, Lebanon, and Syria—have made some efforts but also face varying levels of political and economic transition.
Why has advancement toward the knowledge economy been slow in MENA?

The relation between the 2012 KEI and the 2011–12 GCI is weaker for MENA countries than for the rest of the world (figure 2.5). The disparity is particularly notable for the GCC countries, which score highest on the KEI. In other words, knowledge economy factors play a smaller role in the Arab countries than one would expect given their level of competitiveness.

MENA countries appear to exhibit what may be termed “knowledge-weak competitiveness,” which means their competitiveness is derived from factors other than those related to knowledge (Taha 2010; Koivisto 2012). Across the region, the national capacity for knowledge absorption, which relies largely on investments in human capital and on openness to trade and foreign direct investment (FDI) to build competitiveness, remains low. The region seems to have reached a plateau over the past decade in its advancement toward the knowledge economy.

There are several reasons for this lackluster performance. The bulk of economies in the Arab world are factor-driven economies, which need to change into efficiency- and innovation-driven economies. Political and economic volatility, especially in the recent past, have also exerted a downward pull on the KEI by weakening the overall economic and institutional regime (EIR). Current events, however, provide a good window of opportunity to develop more transparent and effective economic governance and unleash the region’s potential.

The economic performance of the countries of the region has been held back by their relatively weak EIR (except in the GCC countries). Indeed, the index for the EIR pillar is strongly correlated with the overall KEI (figure 2.6) because the EIR has substantial influence on performance across other knowledge economy pillars. Mediocre governance, resulting in a poor business climate, is one of the greatest hindrances to economic and social development in the region, and to knowledge-based development in particular.

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5. The GCI has been the key methodology used by the WEF in its assessments of competitiveness. The model rests on the belief that the determinants of competitiveness are numerous and interact with one another in a complex manner. The GCI captures these interactions through a weighted average of 12 pillars of competitiveness: (i) basic requirements that are key for factor-driven economies, including institutions, infrastructure, the macroeconomic environment, and health and primary education; (ii) efficiency enhancers that are key for efficiency-driven economies, including higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, and market size; and (iii) innovation and sophistication factors that are key for innovation-driven economies, including business sophistication and innovation (WEF and OECD 2011).
Chapter 2: Catching up with global knowledge economy trends

A recent World Bank report reviewed the economic performance of more than 100 countries over the past 30 years and found empirical evidence supporting the idea that economic freedom and civil and political liberties are at the root of why some countries achieve and sustain better economic outcomes while others do not (Chauffour 2011). The study showed, for instance, that a one-unit change in the initial level of economic freedom between two countries on a scale of 1 to 10 is associated with an almost 1 percentage point differential in their average long-run economic growth rates. In the case of civil and political liberties, the long-term effect is also positive and significant, with a differential of 0.3 percentage point. The expansion over time of the conditions of freedom—economic, civil, and political—also positively influences long-run economic growth. These findings provide potentially important policy lessons. In middle-income countries, such as those in the midst of the Arab Spring, there is now a quest for civil and political rights and also economic freedom. If successful, this, combined with the reduction of existing privileges and entitlements, should lead to greater economic growth.

The EIR is a key pillar of the knowledge economy. Its major elements are macroeconomic stability, competition, efficient regulatory policies, the rule of law, and legal rules and procedures that are conducive to entrepreneurship and risk taking. A particularly important component of the EIR is the quality of government, because the integrity and effectiveness of government determine the basic rules of a society. An effective EIR also includes a competitive environment that stimulates improved economic performance, a financial system that mobilizes and allocates capital to its most productive uses, flexible labor markets (including support for improving the skills of the labor force), and effective safety nets to facilitate adjustment to constant restructuring.

An important measure of how well the economic regime is functioning is the extent to which countries are open to tapping various sources of knowledge that can help them perform successfully in the global economy. With a few exceptions, MENA countries have by and large remained isolated from the global economy. The KOF Index of Globalization (KOF ETH 2010) measures the economic, social, and political dimensions of globalization. These dimensions are captured by economic flows (trade, FDI, portfolio investment, and income payments to foreign nationals as shares of gross domestic product, GDP), social globalization (personal contacts, information flows, and cultural proximity), and political globalization (embassies, memberships in international organizations, and international treaties). The 2012 index includes 208 countries. Five Arab countries are ranked in the top 50, 4 of them resource-rich countries from the Gulf: the UAE (with a score of 75.69), Kuwait (71.42), Bahrain (68.83), and Qatar (66.53). The fifth is Jordan, which comes behind Kuwait with an overall score of 70.48. At the bottom of the rankings are Syria (42.78), Iran (40.69), and the West Bank and Gaza (33.13).

One way to tap into the growing stock of global knowledge is by attracting FDI, which can facilitate the transfer and cross-border adoption of new knowledge and technology. The 2012 A.T. Kearney FDI Confidence Index examines future prospects for FDI flows to 27 top investment destinations at a time when the world economy is trying to recover from the global recession.

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6. The KOF Index of Globalization defines globalization as the process of creating networks of connections among actors at multicontinental distances, mediated through a variety of flows including people, information and ideas, capital, and goods. Globalization is conceptualized as a process that erodes national boundaries, integrates national economies, cultures, technologies, and governance, and produces complex relations of mutual interdependence.

7. The 2012 A.T. Kearney FDI Confidence Index assesses the impact of political, economic, and regulatory changes on the FDI intentions and preferences of the leaders of top companies around the world. The 2012 index is based primarily on a proprietary survey of more than 200 executives from 27 countries and 17 industry sectors [http://www.atkearney.com/index.php/Publications/cautious-investors-feed-a-tentative-recovery.html].
The only Arab country on the list is the UAE, which ranks 15th. As an investment gateway to the Middle East, it could benefit somewhat from the current political upheavals elsewhere in the region if foreign investors decide to opt for its relative stability.

It is also instructive to look at the overall trade environment throughout the world. The WEF’s [2012] Global Enabling Trade Report—a comprehensive compendium of the trade environments of 132 countries—ranks the UAE as number 1 in the Arab world, and number 19 globally in terms of its trade-enabling environment. Second in line in the Arab world is Oman (25), followed by Saudi Arabia (27), Bahrain (30), Qatar (32), Jordan (42), and Tunisia (44). Kuwait ranks lowest among the GCC states at 66. Egypt (90), Lebanon (93), Syria (108), and Yemen (119) round out the list. It is revealing that the Arab world’s top five trade-enabling states are all in the GCC region. While each country is different, the domination of the GCC reflects poorly on some of the more populous, oil-importing Arab states that require the vital catalyst of a trade- and business-boosting regulatory environment to meet the needs of their populations.

The Heritage Foundation’s Index of Economic Freedom ranks 184 countries on 10 measures of economic freedom related to the rule of law, the intrusiveness of government, regulatory efficiency, and openness of markets. Not surprisingly, the 2012 index shows that economic freedom around the world declined over the past year. Among the top 25 freest economies in the 2012 index, 2 are in the Arab region: Bahrain (position 12) and Qatar (25). Jordan occupies position 33, followed distantly by Morocco (87), Lebanon (90), Tunisia (95), and Egypt (100). These results suggest that gloomy economic prospects, income inequality, and corrupt regimes could have been important motivators in the Arab uprising that began in late 2010.

Improving the overall business climate is essential to create opportunities for domestic entrepreneurs to grow and create employment. The Arab World Competitiveness Report, 2011–12 (WEF and OECD 2011) highlights the challenges for doing business in the Arab world (figure 2.7). According to business leaders, restrictive labor regulations, inefficient bureaucracy, and a lack of access to finance are the top three hindrances to doing business in the region.

The 2012 Doing Business Index for 183 countries tracks changes in the regulations that apply primarily to small and medium-sized domestic companies in 11 areas of their life cycle. The 2012 index ranks 4 GCC countries in the top 50 (World Bank 2012b). Saudi Arabia ranks number 1 in the Arab world and number 12 globally, followed distantly by the UAE (33), Qatar (36), and Bahrain (38). Tunisia comes in at 46, followed by Oman at 49. Among Arab economies, 13 implemented reforms in 2011 to make it easier to do business—20 such reforms in all. Half of these reforms focused on making it easier to start a business or on improving credit information systems, but opportunities for regulatory reform and greater transparency remain. Entrepreneurs across the Arab world continue to face often complex and costly regulatory processes to start and run a business, and contend with weaker investor and property rights protections than their counterparts in other regions. The regulatory environment varies across the region. Morocco was the most active in implementing regulatory reforms in 2010–11. The new report indicates that over the past 6 years, 94 percent of the 18 Arab economies in the sample made their regulatory environment more business friendly. Egypt made the greatest progress in this area, between 2005 and 2011, followed by Saudi Arabia.

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**FIGURE 2.7**

Doing business in the Arab world

![Diagram showing constraints to doing business in the Arab world.](https://via.placeholder.com/150)

Source: WEF and OECD 2011.

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8. The Heritage Foundation’s Index of Economic Freedom analyzes economic policy developments in 184 countries since the second half of 2010. It is based on 10 components: business freedom, trade freedom, fiscal freedom, government spending, monetary freedom, investment freedom, financial freedom, property rights, freedom from corruption, and labor freedom [http://www.heritage.org/index].
These indexes are useful barometers of where each nation stands. Over the past two decades, most GCC states have worked on their overall governance and engaged in globalization in a more sophisticated manner. But most still need to diversify their economies and build more sustainable knowledge and private-sector-driven economies. Some weaknesses across the GCC states are public education, poor work-culture practices, and underdeveloped entrepreneurial support networks (Molavi 2012).

Encouraging women’s participation in all spheres of economic, social, and political life is key for MENA to tap its wealth of human resources. How the region’s societies will enhance women’s inclusion remains an open question. Using a comparative perspective, the KAM reveals that unemployment and inactivity among women are more prevalent in MENA than in other middle-income regions such as ECA and LAC (figure 2.8). Arguably, greater economic empowerment can stimulate a virtuous circle that includes women’s empowerment. Targeted and coordinated efforts, specific to the country context, are needed on multiple fronts to increase women’s participation in the public sphere. These include policies to secure women’s equality under the law, address the remaining human development challenges, redress the skills mismatch, and promote women’s civic and political participation (Viswanath 2012).

Education and human resources

Education is the fundamental enabler of the knowledge economy, because well-educated and skilled people know how to create, share, disseminate, and use knowledge effectively. In addition to traditional “hard” skills such as literacy, “numeracy,” and, more recently, ICT competencies, today’s knowledge economy demands “soft” skills such as communication ability, problem solving, creativity, and teamwork. The development of a knowledge economy requires a flexible education system to deliver the right amounts of both types of skill. That system begins with basic education, which lays the foundation for learning, and continues with secondary and tertiary education to develop core skills (including technical skills) and to encourage the creative and critical thinking that are key to problem solving and innovation. The education system must also include provisions for lifelong learning.

Results on international educational tests indicate that outcomes for the region remain significantly below those of the Organisation for Economic Co-operation and Development (OECD) countries. None of the 12 MENA countries that took part in the international 2007 Trends in International Mathematics and Science Study (TIMSS) test of eighth-grade math and science capabilities achieved above-average scores (figure 2.9). One of the weaknesses of the region’s education system is that most MENA countries lack national standards for achievement in learning, and those that have such standards do not use the tests to promote accountability in the system (Ezzine 2009).

The results of the 2009 Programme for International Student Assessment (PISA) are also instructive for the few countries in the region that participated. Compared with the OECD average, Jordan, Qatar, and Tunisia trail their peers in science, math, and reading (figure 2.10). The results also show that high-order cognitive skills are quite low in the region. This is critical, as a large proportion of secondary school graduates who enter higher education institutions do so with already low levels of cognitive skills.

**Figure 2.8**

Women’s participation in a comparative perspective, 2012

![Chart showing various indicators of women's participation and education in MENA](source: Knowledge Assessment Methodology www.worldbank.org/kam, World Bank 2012a).

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9. The PISA, an international study that began in the year 2000, evaluates education systems worldwide by testing the skills and knowledge of 15-year-old students in participating countries/economies. Since the year 2000 over 70 countries and economies have participated in the PISA.
Chapter 2: Catching up with global knowledge economy trends

The education report card for the Arab world paints a picture that is far from rosy. A recent report (Faour 2012) includes indexes that combine data from three international studies (2007 TIMSS, 2006 PIRLS, and 2009 PISA) that measure schools’ safety, teaching, learning, and institutional environments in 14 Arab countries. To illustrate just two areas for improvement: data show that substantial percentages of teachers (for example, math teachers) entered their profession with deficient academic preparation and preservice training. Many teachers do not receive adequate in-service professional development to help them improve their teaching skills.

There is a persistent gap between the skills acquired at university and the requirements of employers. Enterprises often cite a lack of suitable skills as an important constraint to hiring; according to the World Bank’s Enterprise Surveys, firms identify labor skill levels as a major constraint in Lebanon (38 percent of surveyed firms), Syria (36 percent), Jordan (33 percent), and Egypt (31 percent). The WEF has also identified an inadequately educated labor force as one of the challenges to doing business in the Arab World (WEF and OECD 2011).

A nation’s innovation system consists of the network of institutions, rules, and procedures that affect how the country acquires, creates, disseminates, and uses knowledge and technology. It includes firms, research centers, universities, consultants, and other organizations that keep up with new knowledge and technology, tap into the growing stock of global knowledge, and assimilate and adapt that stock to local needs. Linkages between national and global knowledge systems can take the form of joint research, personnel exchanges, cross-patenting, licensing of technology, purchase of equipment, and a variety of other channels. The innovative performance of a country depends to a large extent on how various national actors relate to one another as members of a broader system.
On the innovation pillar, the 2012 KAM measures advances in royalty and license fees (payments and receipts), patents granted by the U.S. Patent and Trademark Office, and articles in scientific and technical journals (figure 2.11). The latest results reveal that Algeria, Lebanon, Oman, Qatar, Tunisia, the UAE, and Yemen have improved their score since 2000, while Egypt, Jordan, and Morocco have regressed. One of the reasons behind the region’s mediocre performance is the shallowness of the scientific base, which the Arab world needs to improve if it is to build cutting-edge industries. In a region that is home to some of the world’s oldest universities, which have contributed to global knowledge for thousands of years, scholars in the countries of the Arab League produce little more than 0.5 percent of the world’s scientific journal articles. Arab countries also spent less than 1 percent of GDP on research and development as compared to 2.3 percent of GDP in the OECD countries in 2009. For many MENA countries that are still far behind the global frontier in many sectors, tapping into and making effective use of existing global knowledge through channels such as trade and FDI could have a greater economic impact than developing frontier knowledge.

The 2011 Global Innovation Index (GII) ranks 125 countries and economies in terms of their innovation capacity and results [INSEAD 2011]. The report distinguishes between efficient innovators—those countries that surmount weaknesses to achieve more innovation outputs than their innovation resources (inputs) would suggest—from those that do not fulfill their theoretical potential for innovation.10 The overall GII scores provide a composite picture of a country’s innovation performance.11

The GII includes 16 countries from the Arab world, with Qatar ranked among the top 30, in position 26. The other high-income economies in the region occupy lower positions: UAE (34), Bahrain (46), Kuwait (52), Saudi Arabia (54), and Oman (57). Middle-income countries such as Lebanon (49) present weaknesses in both input and output indicators of innovation. The other lower-middle-income countries—Tunisia (66), Egypt (87), and Morocco (94)—are all in the lower half of the GII rankings, with Syria (115), Yemen (123), and Algeria (125) among the bottom 25.

Jordan is a notable exception in the GII—it ranks 4th among the MENA countries covered by the index and 41st overall. Its position is notable because it is more than 25 positions ahead of its closest competitor in the same region and income group, Tunisia (66). Although Jordan is only eighth in the region on innovation inputs, it is third in output. Jordan’s leverage comes from creative outputs, with a strong dynamism at the level of residents’ trademark registrations at the national level (where it is placed first in the region) and a relatively high level of exports of creative goods.
Information and communication technology

Rapid technological advances are dramatically affecting the acquisition, creation, dissemination, and use of knowledge. As knowledge becomes an increasingly important element of competitiveness, the use of ICTs is reducing transaction costs and demolishing barriers of time and space, allowing the mass production of customized goods and services and substituting for limited factors of production. A country’s information infrastructure consists of: telecommunications networks; strategic information systems; policy and legal frameworks affecting the deployment of those networks and systems; the skilled human resources needed to develop, operate, and use them; and a population that is able and can afford to use ICTs. To develop a strong information infrastructure, it is necessary to mobilize the many stakeholders involved in its deployment and use—chief among them government, business, consumers, and providers of telecommunications and information services. Applications of ICTs are also improving the efficiency of existing services and creating new opportunities, as in trade, governance, education, business connectivity, healthcare delivery, and environmental development.

The WEF’s Global Information Technology Report 2012 covers 142 economies and includes the Networked Readiness Index (NRI), which has been measuring the degree to which economies across the world leverage ICTs for enhanced competitiveness. The 2012 NRI framework gauges the degree to which a country’s market and regulatory frameworks support high levels of ICT uptake; the degree of a society’s readiness to make good use of an affordable ICT infrastructure; the efforts of individuals, businesses, and government to increase their capacity to use ICT as well as the actual use of ICT in their day-to-day activities; and the broad economic and social impacts accruing from ICT and the transformation of a country toward an ICT- and technology-savvy economy and society.

The GCC countries again feature prominently in the rankings in both the 2010–11 and 2012 NRI (figure 2.12) with 3 in the top 30—Bahrain, Qatar, and the UAE. Algeria, Egypt, Morocco, Syria, and Tunisia improved their ranking in 2012, while Lebanon maintained its position.

The MENA region is emerging as a promising offshore location for European firms taking advantage of the region’s proximity and pool of skilled talent for providing outsourcing activities (including IT services and support, contact centers, and back-office support). Indeed, the countries in North Africa have eclipsed several Eastern European locations, as demonstrated in A.T. Kearney’s 2011 Global Services Location Index of the top 50 countries for outsourcing activities, which places Egypt 4th in the world and the leader in the Middle East. Although the rankings were compiled before the recent political unrest began, Egypt has scored well over time because of its relatively low-cost skilled labor. The Egyptian government has also actively promoted the sector abroad, while pushing firms to bring their standards up to international levels. But the recent political turmoil in the country could have long-term consequences for Egypt as a sourcing location. The UAE occupies position 15 in the global rankings and serves as a regional services hub that supports many multinational corporations throughout the region, thanks to competitive labor costs, a rise in the quality of its management schools, and an improvement in literacy scores. Other countries from the region in the top 25 are Jordan (22) and Tunisia (23); Morocco is in position 37.

FIGURE 2.12
Rankings of MENA countries on the NRI, 2010–11 and 2012

Source: WEF 2011.

Note: MENA = Middle East and North Africa; UAE = United Arab Emirates; NRI = Networked Readiness Index.


13. Each country’s score is composed of a weighted combination of relative scores on 43 measurements, grouped into 3 categories: financial attractiveness, people skills and availability, and business environment (A.T. Kearney 2011).
Conclusion

This chapter’s benchmarking analysis, based on an examination of a variety of indicators and indexes, yields several striking points. It shows that the MENA region’s progress toward the knowledge economy over the past decade has been slower than that of its close competitors at the global level (that is, the ECA and LAC regions). Moreover, that progress seems to have reached a sort of a plateau. More generally the competitiveness appears to be increasingly factor driven rather than knowledge and innovation driven.

One of the main conditions limiting the knowledge economy performance of the region is the mediocre state of the EIR, particularly the governance climate, in numerous countries. Improvements in this area are important, as they can stimulate significant overall progress toward the knowledge economy and thus toward sustainable long-term growth and competitiveness. Greater economic empowerment of women is also needed to fully tap the region’s valuable human resources (see chapter 4).

Despite impressive achievements in widening access to primary and secondary education, a principal barrier to the development of the knowledge economy in the region is the poor quality of education and mismatches between the skills with which graduates leave school and those required by employers. The region’s major investments in education (as detailed in chapter 5) could be made more effective through additional efforts to improve the quality of education at all levels.

Innovation indicators confirm that the innovation-related efforts and performance of Arab countries, compared with those of the rest of the world, have been modest (chapter 6). For most Arab countries, it will be important to tap knowledge and technology through channels such as FDI, imports of equipment and other goods, and licensing agreements. The diffusion of existing technologies should also receive attention in most MENA countries.

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The region as a whole has made significant progress on the ICT pillar, which must be sustained to take advantage of the potential of ICTs to improve a range of economic and social activities (see chapter 7). All MENA countries would do well to harness the full potential of ICTs for various sectors of the economy: education, innovation, and learning; public sector management; private sector competitiveness; and capacity building. In so doing, they may be able to take advantage of emerging opportunities to leapfrog over early adapters (by adopting the latest technology without having invested in earlier generations of related technologies) and participate in the development of new ICT-based knowledge industries.

The 2012 KAM results also reflect divergent prospects, opportunities, and challenges for different sets of MENA economies. The resource-rich countries with scarce labor (especially in the GCC) show significantly higher performance on the overall KEI and on its components (EIR, education, innovation, and ICTs). These resource-rich countries perhaps face less pressure than other countries in the region, having had the advantage of being able to afford investments in technology and other costly resources. But they still face the challenge of cultivating the talent needed to build and sustain a diversified, knowledge-based economy.

The pressure is on for resource-poor countries with abundant labor to undertake reforms through the development of high-value-added industrial and service sectors. Resource-poor countries would do well to undertake the kinds of regulatory reforms that are needed to enhance education, innovation, and competition—key ingredients for lifting economic growth.

The Arab region as a whole could advance more quickly toward the creation of the high-quality jobs that are so sorely needed by putting in place policies to move ahead on all four knowledge economy pillars, with particular emphasis on strengthening the economic and institutional regime, including governance, and improving the quality of education systems at all levels.

References and bibliography


Chapter 3
Shaping new development strategies for Arab countries

This chapter presents principles to guide Arab policy makers wishing to design and implement knowledge-based development strategies. Succeeding chapters will focus on precise measures to be taken on each of the knowledge economy pillars (Part 2) and on sector and spatial diversification initiatives (Part 3). This chapter sets out a strategic approach for policy makers, providing insight into the “how” of knowledge economy strategies, plotting the implementation of the so-called fifth pillar against the others, and building the nation’s trust and self-confidence in the process of developing the knowledge economy.

The proposed strategic orientations are informed by global experience but adapted to the specificities of the Arab world and the challenges it faces. Of particular interest are: (i) countries such as Finland, Ireland, the Republic of Korea, and Singapore that have achieved notable success with knowledge-economy-based development strategies in the past one or two decades; (ii) low- and medium-income countries that have experienced high and sustainable rates of growth over a long period, including China and India; (iii) the transition countries of Central and Eastern Europe; and (iv) Turkey, which has much in common with Arab countries. Lessons drawn from the experience of a dozen of those countries are summarized in annex 2. These countries share eight features: a vision and long-term strategy, accountability mechanisms, government capability, a preference for market solutions or at least a tilt toward markets, integration in the world economy and diversification of exports, exploitation of global knowledge, investment in education, and investment in and use of information and communication technology (ICT). All of these features relate to the knowledge economy pillars and are discussed throughout this chapter, though not necessarily in the order mentioned above.

The strategy suggested here is one of transformative change, framed within a political economy perspective. Four complementary thrusts shape the strategy:

- Acting with ambition and realism, while adapting policy actions to countries’ development levels, needs, and capabilities
- Engineering change with pragmatism, beginning by gathering low-hanging fruit to produce quick economic and employment gains and proceeding gradually but steadily from demonstration projects to changes of wider scope
- Building a new social contract in parallel with the new economic model
- Pursuing regional integration and international cooperation to speed up and consolidate the overall process of transformation

With respect to the knowledge economy, the region does not start from scratch. Knowledge economy strategies can build on what has already been accomplished in several countries, as described in the introduction (box I.5). But the countries of the region differ in their stage of development and in the degree of their engagement with the knowledge economy. In the course of the chapter, these differences will be taken into account.

Acting with ambition and realism

The first piece of policy advice is to act with speed and ambition—speed, because there is no time to lose and because it is the best way to overcome resistance to reforms; ambition, because the challenges are colossal and action plans of commensurate scale are needed to cope with them. Inspiration can be taken from countries that have embarked resolutely on a knowledge economy model, forswearing business as usual. Their approach is presented in figure 3.1 and box 3.1. They have acted simultaneously on the four pillars, while ensuring a sustainable and reliable process by adopting a multi-stakeholder approach.

While fully embracing the principle of speed and ambition, Arab policy makers must focus on what is feasible and adapted to the needs and capabilities of their country. A number of Arab countries are either in problematic governance conditions or at a relatively low level of economic and knowledge economy development. In such contexts, as illustrated by low- and medium-income countries that have successfully embarked on sustainable high-growth regimes (see annex 2), a gradual approach is appropriate. Reforms of the business environment, for example, generally cannot be implemented across the board in all their aspects. Indeed, they may even have to be limited to specific areas (such as special economic zones). On the education front, in countries at an early stage of development or presenting serious weaknesses in the fundamentals of education, it will be important to give priority to basic lit-
Chapter 3: Shaping new development strategies for Arab countries

FIGURE 3.1
The knowledge economy process contrasted with business-as-usual models of economic growth: Ambition, speed, and mobilization

Source: Rischard 2009.

Note: This figure provides two stylized growth trends; the gaps between the two are not as precisely defined as in the figure.

BOX 3.1
The path followed by the knowledge economy success stories

A sustainable, reliable process of policy advancement and implementation is key to building a knowledge economy. That is the lesson gleaned from studies of several countries that have pursued knowledge-based growth—among them Finland, the Republic of Korea, Malaysia, and Singapore, to which could be added Dubai and Ireland, despite recent crises induced by speculative excess (World Bank 2010). The same studies suggest that a multistakeholder process leading to a clearly defined, national commitment yields higher levels of growth than a business-as-usual growth model.

Content: The knowledge economy pillars

The governments of these successful countries focused their efforts on four knowledge economy pillars, implementing ambitious reforms on all or most fronts:

- They raised the quality of their educational systems—from early childhood education through lifelong learning systems—often setting the standard for the rest of the world in the process (Finland, Korea, Singapore).
- They took bold steps to develop a lively “innovation ecology,” using various routes to get there—a research and development (R&D) boost for Finland, high-tech foreign direct investment (FDI) for Ireland; attracting a creative class for Dubai.
- They improved their business environment by reducing transaction costs, promoting entrepreneurship, and sometimes even turning their cities into magnets for talent by ensuring attractive living and working conditions. In effect, they transformed their economy into a vibrant home base for firms from all over the world, from multinationals to start-ups (Dubai, Ireland, Luxembourg, Singapore).
- They made major investments in information and communication technology infrastructure and in catalytic applications such as advanced e-government (Estonia, Korea, Malaysia, the Nordic states).

Process: Ambition, speed, and mobilization

- **Ambition.** The government itself provided a bold vision, became the top change agent, and mobilized the entire nation around an ambitious national effort, starting with a few key policy measures. Finland quadrupled public spending on R&D when fiscal austerity would normally have been advised. Ireland lowered the corporate tax rate and attracted knowledge-economy-boosting FDI. Dubai launched nearly two dozen special zones in rapid-fire sequence, attracting thousands of sophisticated businesses in a short time. Korea rapidly boosted its broadband density and usage to the point where it is now a world leader on these indicators.
- **Speed.** In each case, the process adopted by the governments of these successful countries emphasized immediate action, by contrast with the more traditional approach of writing voluminous reports or master plans and trusting that this would somehow lead to needed changes on the ground.
- **Mobilization.** Many successful countries established a mechanism to mobilize relevant stakeholders and agents of change. Several, such as Finland and Ireland, set up a high-level council chaired by the prime minister to preside over the knowledge economy effort and to ensure full commitment by the top leadership. Some countries set up special support institutions, such as SITRA and TEKES in Finland, and a “committee on the future” within parliament. Some countries ran multiyear knowledge economy campaigns aimed at mobilizing the entire nation, often with a systematic and sustained communications effort, as in Korea and Malaysia.

Source: Rischard 2009.
eracy and technical training, along with focused and selected efforts on higher education. On the innovation dimension, it will be necessary to focus on tapping into global knowledge and technology and adapting it to local needs rather than on building advanced structures for R&D. On the ICT pillar, it will be necessary to universalize Internet access and promote its use through cheap and user-friendly applications and services for citizens, small businesses, and others, while developing information technology literacy. But no matter how circum-
scribed the focus of the knowledge economy effort, it remains essential to demonstrate strong national determination to succeed with the new development model.

Resource-rich countries obviously are in a better position to engage in bold projects developed at a quick pace—as some of the Gulf emirates have done with a degree of success. The critical point, however, is to adjust ambitions and engagements to what the country is able to deliver. From this viewpoint, most Arab countries, even those that are resource rich, have limitations and constraints. Except for the small Gulf states, Tunisia, and Morocco, which have good track records in designing and implementing knowledge economy strategies, substantial efforts are needed to build administrative and management capabilities as part of their overall knowledge economy plans.

Shortcomings in the state apparatus and the institutional and business environment mean that a fine-tuned sequencing of reforms is required, as demonstrated by the experience of the transition economies of Central and Eastern Europe (Dvorak 2011). A “big-bang” approach does not apply, particularly when it comes to the knowledge economy. Although reforms must be carefully sequenced, this does not mean that halfway reforms (for example, partial liberalization) are appropriate, because they tend to create vested interests bent on rent seeking and provoke resistance to further reforms—something that Arab countries have also experienced. Appropriate sequencing of whole-hearted reforms, by contrast, can avoid reform fatigue, especially as constituencies for reform are consolidated through early but decisive wins. The next section elaborates on the sequenced approach.

Reforms to the business environment can have rapid employment effects. To be sure, nonnegligible employment effects may emerge from reforms that improve the business environment in its various dimensions, among them conditions surrounding the creation of enterprises, the manner in which the economy is financed, and the regulatory framework. Those effects should be factored into the overall strategy. The expansion of trade and FDI generally are an important source of new activities that typically emerge within a relatively short period of time. To provide early results that generate support for the new model, therefore, it is important that reforms to the business environment be undertaken early.

Small business is a key source of jobs. Governments starting down the path to a knowledge economy are well advised to get a good idea of where the potential for job creation lies in their economy. This is especially important when that economy includes very different types of enterprises and a large informal sector. Estimates made for southern Mediterranean countries [ANIMA 2011] provide the following figures, which reveal a trade-off between equity and jobs (figure 3.2). Against an estimated need of 3–5 million jobs per year [FEMISE 2011], multinationals appear to be a source of relatively few jobs (about 100,000), but they bring useful technologies, management skills, and other inputs. The informal sector is an important source of job creation (1 million jobs or more), but its innovative capabilities are limited. The main sources of economic growth and job creation are small and medium-sized enterprises [SMEs] and start-ups, including the so-called “gazelles” (fast-growing companies operating in rapidly moving markets, which, so far, are not numerous in Arab countries). The job-creation potential of SMEs points to the importance of developing policies to support this type of enterprise.

New growth sectors can be an important source of employment and should not be neglected. In fact, the knowledge economy success stories, as well as other good performers, all have put in place active industrial policies to help new sectors take off—in manufacturing, services, or agriculture—based on recognized comparative advantages. This was true, of course, of the East Asian “Tigers,” in which the economy was actively managed by so-called “development states.” But it was also true in the West, where governments provided incentives to induce particularly competitive sectors to take advantage of “horizontal” industrial policies. This is why, when forging knowledge-based development strategies for the Arab world, the four knowledge economy pillars need to be complemented by actions to promote high-growth sectors.

Engineering change, with pragmatism, by building on easy wins

Carrying out reforms and creating jobs

One must pursue reforms and create jobs simultaneously. The reforms needed to build a knowledge-based economy, notably changes to educational and innovation systems, will not bear economic fruit immediately. On the other hand, jobs must be created as soon as possible—and in significant number. Early results matter if the new development model is to be credible.

Promoting sectors that are sources of jobs

An aggressive strategy of economic diversification is needed. To date in the Arab world, exploiting comparative advantage has been largely confined to the oil and gas industry, where impressive success stories can be found. Exploitation of the region’s considerable historic and cultural heritage and its geographic and climatic situation—that is, tourism—has also been well developed and has even extended into specialty areas such as

2. The countries surveyed by the ANIMA study include all Arab countries, except those of the Gulf Cooperation Council, plus Israel and Turkey.
as health tourism in Jordan. Lebanon, with its history as a finance and trading center, has established a sophisticated and competitive banking system. In the countries of the Maghreb, some traditional manufacturing niches have been exploited, such as textiles in Tunisia. But only in Morocco has a more or less systematic policy of sector promotion been launched through a series of plans that cover the actions needed in selected industries (for example, automobiles, manufacturing, and food processing), often in tandem with regional development plans (see chapter 8). An aggressive approach that draws inspiration from such examples is needed throughout the region. The Arab world has many unexplored sources of comparative advantage.

The changing conditions of the global economy—with mass industrial production dominated by China and other Asian countries, and recession-dampened demand from the developed world—call for a reconsideration of trade- and export-led growth strategies. In Arab countries, there are some opportunities in manufacturing for export to markets in Europe and Africa (for example, in parts and components for automobiles, electronics, and aeronautics; see box 3.3). But it appears likely that, in addition to ICT-related industries and services, the sectors and activities that are likely to be the major sources of growth and employment in the decades to come include: nontraded goods, domestic public and private services, education and research, construction and building, and activities related to renewable energy (solar), environmental stewardship, water use and conservation, and the mitigation of climate change. How many jobs can the most dynamic activities and sectors create in the Arab world in the medium and long term? Some rough indications are given in box 3.2.

Several promising niches can be expanded. Some promising niches identified by foreign investors over the past decade are detailed in box 3.3. They include service activities such as call centers, software development, consulting and business services, and R&D centers, and manufacturing activities such as textiles, automobiles, electronic components, and agribusiness. The so-called job-efficiency ratio, measured by the number of jobs created per million euros invested, ranges from about 40 to as many as 300. A surprising item is the R&D center function, which, with 211 jobs created per million euros invested, shows an attractive potential that so far has been underexploited in Arab countries. Surprisingly, sectors such as public works, real estate, utilities, and tourism, and functions such as franchises, logistics, and headquarters and administrative centers, perform rather poorly in terms of job efficiency. The jobs created by FDI are too costly to allow one to expect FDI to solve the job problem in Arab countries, at least not in the southern Mediterranean. This is why domestic sources of jobs, promoted through an efficient knowledge economy approach, are crucial, without disparaging the technology, management, and other inputs that FDI can bring in.
Chapter 3: Shaping new development strategies for Arab countries

The poor governance climate and business environment found in several Arab countries is not going to be changed overnight. Even in the best-performing countries, everything is far from perfect. It is therefore important to attack such situations. Change often begins with micro-reforms well tuned and well targeted to specific organizational settings or sets of enterprises that, once their performance is improved, become role models or sources of inspiration for broader initiatives. There is often an element of serendipity in such processes, but clever management by government authorities plays a role as well. Some governments are experts in engineering change in a gradual manner appropriate for overcoming potential resistance. In the early years of its takeoff, China developed town and village enterprises and export zones. From semi-private production for local markets, these entities evolved into experimental special export zones, which gradually were extended in scope and scale. Foreign investors were enticed to bring in their technology and management expertise, and to connect the new enterprises to trade and export networks. Eventually, Chinese high-tech entrepreneurs established their own companies.

**BOX 3.2 How many jobs can be created by new and innovative sectors in the Arab world?**

Estimating the job-creating power of fast-growing and rapidly diversifying economic activities is necessarily a speculative endeavor, at least until the enterprises behind those activities reach a plateau in a given country or region. What follows, therefore, is to some extent surmise. One may reasonably expect a high growth rate for activities related to information and communication technology, at minimum a doubling of the volume of the sector over 10 years. The same may be true for green-growth-related sectors. The Marseille Center for Mediterranean Integration (CMI 2012) predicts that the jobs created by green growth could be as many as 3 million to 4 million—10 percent of the total needed in the southern Mediterranean countries over the next 10 years to avoid an increase in unemployment from the existing level. Adding the job potential of other promising growth sectors (see chapter 8), it is not unreasonable to estimate that new activities induced by a knowledge-economy-based model could be the source of at least 30 percent of the total number of jobs needed in the Arab world over the next decade. These estimates are consistent with those provided by the model of the employment elasticity of knowledge economy growth presented in chapter 1. With improvements in skill development, labor markets, and economic structures, the number of additional knowledge-economy-related jobs created could range from 25 to 50 percent over a 10-year horizon, with variations from country to country (the impact being stronger in oil-importing developing countries).

**BOX 3.3 The job-efficiency ratio: How many jobs will €1 million bring?**

The following are estimates of the number of jobs created per million euros invested, based on analysis of some 5,000 foreign direct investment projects; 1,500 investment feasibility studies; 1,600 company partnerships; and 20,000 company press releases over the period 2003–10:

- 299: Call center (regardless of sector)
- 211: R&D center (information technology and automotive)
- 196: Textile manufacturing
- 136: Consulting and business services
- 103: Software (services)
- 103: Electronic components manufacturing
- 77: Agribusiness
- 63: Automotive and aeronautics manufacturing
- 39: Green-tech

**Source:** ANIMA 2011.

### From micro-projects to macro-reforms

**Growth spots stimulate change.** The poor governance climate and business environment found in several Arab countries is not going to be changed overnight. Even in the best-performing countries, everything is far from perfect. It is therefore important to attack such situations. Change often begins with micro-reforms well tuned and well targeted to specific organizational settings or sets of enterprises that, once their performance is improved, become role models or sources of inspiration for broader initiatives. There is often an element of serendipity in such processes, but clever management by government authorities plays a role as well. Some governments are experts in engineering change in a gradual manner appropriate for overcoming potential resistance. In the early years of its takeoff, China developed town and village enterprises and export zones. From semi-private production for local markets, these entities evolved into experimental special export zones, which gradually were extended in scope and scale. Foreign investors were enticed to bring in their technology and management expertise, and to connect the new enterprises to trade and export networks. Eventually, Chinese high-tech entrepreneurs established their own companies.

The design and implementation of knowledge economy strategies should be approached as a pragmatic and opportunistic process. That means that countries should begin by picking the low-hanging fruit, building on growth spots, and exploiting natural or constructed comparative advantages in well-defined sectors after making initial investments in knowledge and entrepreneurship and carrying out basic regulatory reforms. Harvesting the low-hanging fruit creates positive momentum and builds trust, which in turn makes it easier to elicit further investments from both the private and the public sectors. As broader reforms are engaged, a virtuous spiral begins. (See, for example, the experience of Asian comparators, as outlined in annex 2.)
## TABLE 3.1 Appropriate policy measures for countries at various stages of advancement toward the knowledge economy

<table>
<thead>
<tr>
<th>Likely employment impacts indicated by shading (see note)</th>
<th>Stage I: Beginners</th>
<th>Stage II: Adopters</th>
<th>Stage III: Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low rank on the Knowledge Economy Index (KEI); embryonic knowledge economy policies</td>
<td>Expand sector programs by entering more competitive areas (more complex value chains).</td>
<td>Diversify additional competitive sectors and build new ones (services) to become world leaders.</td>
<td></td>
</tr>
<tr>
<td>Improve the economic and institutional regime (EIR) in enclaves or in selected policy areas (for example, business creation), and begin fundamental governance reforms.</td>
<td>Extend EIR reforms and consolidate governance reforms; revisit trade agreements.</td>
<td>Revisit governance, build indigenous delivery capability, and widen trade.</td>
<td></td>
</tr>
<tr>
<td>Make information and communication technology (ICT) as widely available as possible and carry out demonstration projects (for small businesses, community services, and so on).</td>
<td>Build ICT services and promote ICT-based activities (business process outsourcing); accelerate achievement of nationwide broadband.</td>
<td>Build an advanced information and knowledge society that serves as a model for the larger Arab community.</td>
<td></td>
</tr>
<tr>
<td>Build innovation capabilities by tapping foreign knowledge; conduct demonstration projects at the micro-level.</td>
<td>Develop research and development (R&amp;D) structures and build innovation systems on indigenous competencies.</td>
<td>Build top-level R&amp;D structures that are fully plugged in to global networks.</td>
<td></td>
</tr>
<tr>
<td>Make basic reforms in education systems and introduce selected changes and pilots in higher education.</td>
<td>Pursue reforms of education systems, generalizing progress across layers.</td>
<td>Develop top-level education structures as global platforms.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors.

Note: The unshaded cells indicate little or no impact on jobs. Pale blue shading indicates a moderate impact in terms of new jobs created or existing jobs saved. Dark blue shading indicates a high impact on jobs.

Taking a gradual approach leading from micro-reforms to macro-changes is advisable when implementing overall strategies. The objective in the early phases is to change mindsets and behaviors. Major reforms and employment effects are not to be expected in the short term. The approach may be conceived as follows. The first phase must include workable and convincing micro-projects that have demonstration value—that is, that have immediate, visible effects. The second phase consists of a series of such projects organized into well-designed programs. The overall perspective of policy makers and the population then begins to evolve, and they are prepared, in a third phase, for broader and deeper reforms that lead to major changes on a national scale (figure 3.3).

Several Arab countries are approaching or have reached the stage where they should envisage full-fledged reforms, having already progressed significantly on the various policy pillars and demonstrated obvious capabilities to engineer complex sector plans. Morocco, Tunisia, Jordan, and Oman are among the (relatively) advanced reformers.

In these countries and elsewhere in the Arab world, growth organizations and innovative sites are emerging and need to be exploited and expanded. These organizations and sites have brought economic growth and stimulated change. As seen in subsequent chapters of this report (notably chapter 6), they have taken the form of nascent industrial clusters, innovative universities specializing in technology or management, and pioneer venture capital organizations, among others. In several countries, these initiatives are nearly sufficient in number and size to create the momentum required for major reforms. It is important to take stock of such promising changes in industry, commerce, administration, higher education, and other sectors and to take steps to nurture them. That is precisely the role of innovation programs that aim to stimulate new forms of collaboration between university and industry, new innovative activities, business start-ups, and so on. These have materialized in the Arab world, as elsewhere, in the form of incubators (several hundred of which now exist), and in the 50-odd technoparks found throughout the region. But they need to be improved in their design and functioning, and to be complemented by new types of measures inspired by those in place in developed countries (see chapters 6 and 9).
to a significant segment of the population and acceptable living conditions, notably through subsidies for basic goods (bread, fuel, and so on). Sometimes referred to as the “authoritarian bargain model” (FEMISE 2011), that contract has gradually lost ground and proved unsustainable, as discussed in chapter 1. Authoritarian regimes have not delivered enough in return for the sacrifices demanded of the population. Instead, they have appropriated a growing share of national wealth for a shrinking share of the population. As unemployment grew, so did frustration, ending with the events of the Arab Spring. Some regimes have been overthrown, while others, flush with oil revenue, have been able to cope by distributing resources to the population. As some countries search for a new democratic foundation, others are in a state of civil war, with ruling powers unwilling to change. In these new configurations, religious beliefs play a capital role, having influenced the democratic transition in Egypt, Tunisia, and Morocco. In their search for a new social contract, Arab countries will have difficulty finding a model to copy in other cultures. They will have to look into the foundations of their own identity to find the basis of a new social contract (box 3.4).

After a regime change, the sooner a new and efficient economic path can emerge, the better, as the new path can help consolidate the new political regime. That is the lesson of several East Asian authoritarian states, in which political leaders who had initiated regime changes—Deng Xiaoping in China, Park Chung-hee in Korea, Lee Kuan Yew in Singapore, and Mahathir Mohamad in Malaysia—put their country on a new path (see annex 2). The same process was key in Central Europe, as several countries made their way successfully to democracy and a market economy after a few years of depressive and chaotic indecision. In general, rallying a country in full mutation behind a set of efficient economic and political policies is often essential in preventing irreversible decline (Acemoglu and Robinson 2011).

Establishing a new social contract built on efficient political institutions should prove easier where a knowledge-based economic regime has taken root. When it begins to produce wealth and jobs, a new economic model helps to reassure frustrated populations. Therefore, knowledge-economy-related reforms and initiatives make sense even in quite dysfunctional institutions, for they may be the best way to help institutions evolve. Likewise, selling the new knowledge-economy-based model to the people makes sense, but only if one is realistic about what it can deliver. It is necessary to make commitments on the reforms to be implemented, and on the measures that will be taken to implement them, so as to manage expectations related to job creation, income generation, and so on.

The new social pact that accompanies the knowledge economy model should include mechanisms to:

- Redefine the role of the state to support nascent markets and enforce laws and regulations. Efficient judiciary systems are needed to protect the entrepreneurs and innovators that will emerge in the new economy.
- Organize the participation of change agents and the people as a whole in the design of the new economic and political model. Young people, entrepreneurs, and women’s movements are among the groups that should be included in the design.

In search of a new social contract for the Arab world

Neither the Western nor the Asian system offers an appropriate model for the Arab world as it seeks to evolve away from inefficient authoritarian regimes. A fully democratic system in a Western style, with highly individualistic societies, supposes fully secular governments, strong and efficient judicial bodies, and so on. An efficient Asian system, whether authoritarian or democratic, is based on secularist principles and on adhesion of individuals to the nation as a collective body—a phenomenon not found in Arab culture, where the national collectivity is more fragmented.

The most attractive foreign model may be that of Turkey, whose principles are (i) a unique cohabitation between secularism and political Islam; (ii) balanced relations between the state and the market, with a growing business sector benefitting from the actions of an efficient bureaucracy; (iii) integration in the world economy, thanks notably to long-term trade agreements with the European Union (EU); and (iv) military integration in the North Atlantic Treaty Organization (NATO) (Uigen 2011). But Turkey’s model is a system: each factor allows the others to work. For that reason, it is difficult to imagine transferring it wholesale to Arab countries, where one or more of the key components of the system may be missing or underdeveloped.

It would appear, therefore, that Arabs must search in their own identity and culture to build new sociopolitical models. The solution probably lies in a mix of Arab countries’ experiences—including aspects of the relative success of Morocco and Tunisia at the western end of the region, and of the Gulf states (Qatar, United Arab Emirates [UAE], and Oman) at the eastern end. It should be possible to combine strong leadership with clear adhesion to Islam, while remaining tolerant and open to other cultures and gradually integrating values of democracy and civil rights, notably for women.

Source: Authors.

and construction of the new economic model, given their vocal quest for respect and dignity, freedom of expression, and the rule of law, as well as their independence from the old regimes.

- **Decentralize**, thereby encouraging the mobilization of local talent, energy, and resources in contexts that have been affected by centralized decision-making processes for ages.

- **Engage key knowledge institutions**, such as educational institutions and research centers, in active reforms to better serve the needs of the economy and society. Those reforms can be stimulated through new forms of incentives and new criteria for budget allocations, among other means.

**The need for vision**

To justify and motivate the effort and performance demanded of the population, a compelling vision is needed. That vision must express the new development model and give it a concrete goal. Some striking cases exist among comparator countries (see annex 2). Singapore has constantly reinvented itself to hold onto its position as a top global hub, first in logistics and now as a higher education destination. Korea set out to become a world leader in manufacturing, and succeeded. After the setback of the 1997–98 Asian financial crisis, the country developed a new vision to transform itself into an advanced knowledge economy. In the West, among the successful transition countries, Estonia has promoted itself as a wired country, and Slovakia as a top European manufacturer, which today produces more automobiles per capita than any other country.

In the Arab world, several countries have developed a vision, but with uneven success. Tunisia pursued the image of a dynamic information society, but that pursuit was jeopardized when investments were skimmed by the ruling power. In Saudi Arabia the building of new cities and top-level universities was part of a new vision, but lack of success in meeting the job challenge has sapped its credibility. In Morocco a series of successfully implemented sector development plans are parts of a vision for the country’s modernization, but their outcomes are not yet tangible enough to command the strong adhesion of the population to a new development model. To date, it is in the small Gulf states that the clearest visions have been formulated and concretized.

**Credible visions require appropriate—and credible—action.** Clear, compelling goals must be voiced by national leaders. Powerful interdepartmental, interministerial, or interagency committees must coordinate complementary actions. Media campaigns must energize the population, offering success stories that inspire confidence. The difficulty, of course, is to deliver on the vision. But if appropriate mechanisms are put in place, an inspiring vision and expressive slogans can focus minds and ignite change, contributing to success. An important point for governments is to “walk the talk” expressed by the vision—that is, to take concrete steps to make the vision a reality. Even small steps matter. For instance, when new or established regimes have vowed that they will open up societies, increase transparency, and so on, concrete measures should follow in the form of freer access to information, liberalization of the media, and other improvements.

The vision should raise pride. It should remind listeners of the extraordinary scientific achievements of the Middle Ages, when Arab civilization led the world in preserving and disseminating...
knowledge and technology derived from Greece, Rome, India, and China. It should validate the contemporary creativity of the Arab world, not, perhaps, in the realm of flashy innovations and technologies, but in the more modest achievements recorded in cities, slums, and rural areas that have created jobs, improved services, protected the environment, and so on. The media channels that serve the Arab world, such as Al-Jazeera and El Arabia, would be natural allies in this regard. The Web, too, would be a logical means of circulating the inspiring message of Arab achievement and renewal. Box 3.5 expands on the role played by media in recent events and the potential pressure they can exert for reform. Arab countries can be inspired by the very efficient initiatives that some countries have undertaken to promote the knowledge and innovation model, such as that of the Maeil Business Newspaper in Korea, which launched a nationwide campaign to raise awareness about the knowledge economy in schools, businesses, government agencies, and even prisons. The campaign used a variety of media and featured a multitude of conferences, competitions, and other events (World Bank 2007).

The media are instruments for disseminating knowledge and powerful means of exerting pressure for reform in the region. The media make possible the dissemination of knowledge for development and, when they are independent and credible, can help build a sense of urgency about reforms and stimulate demand for change.

The degree of media liberalization and freedom differ from country to country, but the existence of radio and television stations not under government control has been a key factor in the transformation of the Arab region. The pioneering Al-Jazeera network provided decisive coverage of the revolutions in Egypt and Tunisia, defeating censorship by the authorities and disinformation in the government-controlled media to ensure that the truth emerged, the protest movements came together, and the resistance of ruling powers fell. Revolution aside, the network is one of the few forums for debate on reforms in the region, even if its independence in dealing with certain questions is occasionally in doubt. Other networks, including some based in Europe, have also improved their Arab-language coverage of the region.

The Web, too, is shaking up the region by amplifying the demand for change. Information and expression (but also disinformation) circulate more freely on the Web than in other media, but on balance the existence of the Web makes it difficult for the authorities to hide the truth or dodge debates on key questions. Social networks were the carriers of the revolutions in Tunisia and Egypt, which have 2.5 and 7.7 million Facebook users, respectively.

Images of the violence during the Tunisian and Egyptian convulsions were published online in a form of Web-based people power, a principle that could be expanded to include monitoring the implementation of development policies and programs and the struggle against corruption. For example, in Morocco, the national agency responsible for combating corruption has set up a Web site for citizens’ use (http://stopcorruption.ma/). Such a development, made possible by knowledge economy reforms, particularly in the areas of education and ICTs, constitutes a major opportunity to stimulate demand for reform.

At the extreme, there are cases in which the media can block reforms. Journalistic ethics may lose out to offers of payment for media coverage designed to defeat the adoption or implementation of reform, offered by those who stand to lose from any change to the status quo.

Source: Authors.

Box 3.5

The media as change agents

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Source: Authors.

Fostering regional integration and international cooperation

The decision to integrate fully into the global economy has been a decisive factor in those countries that offer inspiration and success stories in building a knowledge economy. As these countries have taken internal steps—through business environment reforms, FDI incentives, trade openness, and so on—their foreign partners have shown goodwill, extended beneficial trade agreements, provided technical support to facilitate the integration processes, and even provided financial assistance. Examples of international good include the support of the United States for Korea’s early development; the European Union’s treatment of countries seeking membership in the Union (whereby the Union acted as a political and economic anchor driving reforms); active bilateral support (such as the support that Finland offered Estonia, with which it shares cultural and linguistic ties); and common regional trade zones in Europe.

3. The EU also stimulates institutional improvements through the acquis communautaire (the body of accepted EU law and practice) and the Copenhagen criteria, as noted by Dvorak (2011).
and Asia, often through informal arrangements such as the Japan-led Akamatsu (“flight of the goose”) initiative in the 1980s, and agreements such as the Association of Southeast Asian Nations (ASEAN).

The international community can play a decisive role in the migration of the Arab world to a new development model. At least three levels, or types, of integration are possible: integration into the global economy, integration within the Mediterranean area, and integration of the Arab region.

Integration into the global economy

The international community has not always exerted a positive influence on the Arab world, though encouraging signs emerged from the G8 meeting that launched the Deauville Partnership in May 2011. But numerous knowledge economy reforms, some admittedly partial, have been carried out in the region with the support of the international community, notably development institutions such as the World Bank, which, in addition to providing financial support, has performed analytical work to help guide public policy choices. As noted above, these efforts have brought progress, but at a slower pace than in other regions of the world. The missing link in these interventions is probably the sociopolitical dimension, which has two parts: (i) the engagement of all national actors and (ii) good governance. Even with the leverage provided by aid, the international community has not always supported reforms extending to these areas, which are so important for the knowledge economy. At times there appears to have been a tacit agreement on the part of political leaders and business interests on both sides to skirt these subjects. The Deauville meeting may mark a break with past practice, provided the principles of the declaration are scrupulously adhered to.

Countries that embark on a democratic transition and greater liberalization of the economy should be encouraged, through incentives, to launch reforms relevant to the knowledge economy. Such incentives can take three forms:

- Aid increases tied to results from knowledge economy reforms. This incentive must be structured in a manner that prevents the rents that it generates from being captured by the opponents of change. National mechanisms should be favored for the leverage they bring in terms of government effectiveness, transparency, and accountability.
- Preferential trade agreements with countries that embark on reforms. This is currently the most practical approach because of budget constraints in the North and the impact they may have on growth and employment (and thus on the sustainability of the dynamic of change).
- Innovative approaches to migration-related questions. These may include temporary increases in immigration limits and support and incentives for the return of other immigrants. Incentives might include helping returnees to create businesses in their country of origin, and facilitating transfers of funds.

Steps toward integration are discernible. There have been several measures taken by the United States and the EU to support countries that embarked on a democratic transition in the wake of the Arab Spring (Greenfield and Balfour 2012). One outcome of the Deauville meeting was the decision to include partnership countries in the programs of the European Bank for Reconstruction and Development (EBRD). The EBRD will support business enterprises’ projects through equity investments and loans, as it has done since its creation in 1991 for the transition economies of Eastern Europe and the former Soviet Union. It will then act as a complement to the European Investment Bank (EIB) (active in the region through the bank’s Facility for Euro-Mediterranean Investment and Partnership, FEMIP) and the World Bank. A recent report on trade and investment (CMI, World Bank, and Islamic Development Bank 2012b) provides detailed analysis of ongoing progress toward integration, accompanied by recommendations, notably in relation to preferential trade agreements (also see chapter 4).

Integration in the Euro-Mediterranean space

The development of the Euro-Mediterranean area depends largely on the actions of the EU. The support given so far to the southern Mediterranean countries has been rather small compared to that offered to Central and Eastern European countries. In the two decades since the European Union launched its cooperation scheme with Mediterranean partners in 1992, the funds provided to the partner countries have been about 40 times less than those provided to the Eastern Europe countries. A large part of EU support has gone to those countries that have entered in the Union, notably through “pre-adhesion” schemes and then through “Structural Funds” once in the Union. This support, along with the prospect of joining the Union, has played a decisive role in speeding up reform processes in concerned countries, guided by the terms of the adhesion negotiations. By contrast, for the southern Mediterranean countries, the absence of the prospect of membership, along with the limited funding received from the EU, has not encouraged reform efforts.

Following the Arab Spring, the EU has developed a new policy to facilitate Euro-Mediterranean integration, accompanied by a significant increase in funding. Among the policy areas that will benefit from the funding increase are efforts to shape a

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4. The Deauville Partnership was formed at the G8 Summit in Deauville, May 26–27, 2011. Its aim is to provide aid to support the new democracies emerging from the Arab Spring. http://www.g20-g8.com/g8-g20/g8/english/live/news/declaration-of-the-g8-on-the-arab-springs.1316.html.

5. A special fund of $2 billion was set up in May 2012 to support the four “emerging democracies” (Egypt, Jordan, Morocco, and Tunisia). Both Jordan and Tunisia became members of the EBRD in January 2012.
Euro-Mediterranean space for research and innovation featuring multicountry R&D platforms. Although the programmatic aspect of these efforts is still being defined, they appear likely to complement and significantly increase the programs so far developed by the EU for R&D cooperation with the southern Mediterranean countries, which, as noted, have been quite limited in scope and scale.

The many networks that have developed between the two rims of the Mediterranean are a major factor for change and integration. These networks touch on many different topics—among them finance, education, research, innovation, urban development, environment, and youth. They should be encouraged through appropriate incentives, while being stimulated and nourished with adequate information and knowledge exchanged over efficient discussion platforms. Creating and maintaining such platforms is a major objective of the CMI in Marseille (box 3.6).

**Integration in the Arab world**

**Putting the knowledge economy model in place in the Arab region will require enlargement of its market, supported by infrastructure development and the exploitation of synergies in education and innovation.**

To accomplish such a project of market expansion and integration, a regional approach is needed similar to the European model, with its Lisbon competitiveness agenda and Europe 2020 strategy (European Commission 2010). The people of the region are attached to their common identity and have shown their support for various plans for political and economic integration. But the heterogeneity of the region’s countries and quarrels among their leaders, sometimes leading to war, have so far limited the scope of regional political integration. The Arab Spring, by elevating the role of the people, has inspired new hope for stronger political integration. The region should seize this historic opportunity to build a regional growth and employment strategy based on

### BOX 3.6 The Center for Mediterranean Integration

The Marseille Center for Mediterranean Integration (CMI) was created by a group of Mediterranean governments—Egypt, France, Jordan, Lebanon, Morocco, and Tunisia—along with the European Investment Bank (EIB) and the World Bank. It supports development and integration of practices in the Mediterranean region by: [i] providing a space for evidence-based policy dialogue, [ii] producing and disseminating knowledge products, and [iii] supporting cross-sectoral, multipartner regional efforts. Launched on October 9, 2009, the CMI aims to contribute to the building of a new economic and social development paradigm that reflects the expectations of the democratic movements in Arab countries.

The CMI’s programs are organized around three integrating themes:

- **Integrated economies.** Increased employment is the overarching economic objective in the region. Raising productivity, instituting knowledge- and innovation-based reforms, and exploiting linkages through trade, investment, and infrastructure are common elements of current deliberations aimed at shaping new economic models and reform paths. Evidence-based policy discussions will be essential in the region’s transition to advanced-economy status.

- **Sustainable growth.** The Mediterranean region—unequally rich in energy resources, universally poor in water resources, and ubiquitously vulnerable to environmental risk—cannot afford, even in constrained socioeconomic times, to forgo the addition of a strong green dimension to its growth and development strategies.

- **Participatory governance.** At the heart of the radical changes in the region is the aspiration of citizens for a sustained process of transformation toward participatory economic and political governance.

The CMI’s work—networking, outreach, and advocacy for reforms—embraces a range of stakeholders from the public and private sectors and from civil society. The center encourages a dialogue between government and independent practitioners by:

- Developing knowledge in the form of studies, policy notes, and methodologies for sector work at the regional, national, and local levels and providing evidence-based analysis to facilitate public policy debate.

- Providing a venue in which new leaders, decision makers, and practitioners across the Mediterranean can come together in conferences, workshops, and policy dialogues to discuss pressing issues, reflect with their peers, review best practices and lessons learned, and benchmark progress.

- Developing a knowledge platform on the CMI Web site to disseminate knowledge and create virtual meeting spaces for communities of practice and mutual interest.

The CMI programs are led by various organizations, among them the Agence Française de Développement, the Caisse des Dépôts et Consignations, the City of Marseille, the EIB, the Forum Euroméditerranéen des Instituts de Sciences Économiques, the Deutsche Gesellschaft für Internationale Zusammenarbeit, the United Nations Development Programme, Plan Bleu, and the World Bank. These organizations work with regional and national partners, such as think tanks, training organizations, centers of excellence, and other development institutions, particularly on the southern rim of the Mediterranean, to design and deliver programs that address critical development challenges facing the region.

6. A sum of €2 billion is being reserved in the context of the next Framework Program of the European Commission (which will amount to some €80 billion over the period 2013–18).
the knowledge economy. That strategy must promote economic integration, infrastructure development, education, Arab culture, and innovation to meet the challenges of the region and give its workers the resources they need to succeed.

The integration initiative could set a more ambitious long-term objective for economic integration in the form of a common market and budgetary and monetary union. Both of those goals would require greater coordination of macroeconomic policies. The current mechanisms of mutual assistance in the region—bilateral and multilateral development institutions—should be reformed to accelerate economic convergence of the various countries and, within each country, of the various localities (provinces, governorates, territories). Also important, because they may make it possible to shrink, somewhat, the considerable intraregional disparities in income, are efforts to reduce unemployment among youth and women, as well as social inequalities.7

The current political and institutional setting is not suited to the new challenges. The Arab League, founded in 1945, functions on the principles of unity and noninterference in domestic affairs, and the league’s decisions must be unanimous. In the area of economic and social integration, the Arab League has made positive contributions, for example, in adopting the Greater Arab Free Trade Area (GAFTA) and putting in place financial institutions for mutual assistance within the region. But it is not set up to coordinate public policies, develop the standards needed for economic integration, or to manage regional programs related to the pillars of the knowledge economy, all of which require a regulatory authority capable of overruling, or at least influencing, national regulations. It is therefore imperative that the organization move toward a new model that is better adapted to the regional context and that embodies best practices borrowed from other integrated areas, particularly the EU.

Institutions specializing in the knowledge economy lack dynamism and will have to be revisited. The region already possesses institutions responsible for education and ICT. But their financial resources are limited, their management model is not based on performance, and their results have not been remarkable. As part of the process of developing a regional knowledge economy strategy, it will be essential to define an institutional framework for implementation of that strategy. The relevance of the existing institutions should be reexamined. Those that are not eliminated will need to be guided by performance-oriented strategic plans and funded adequately.

Four strategic principles have been suggested above:

- Acting with ambition, tempered by realism, in policy reforms
- Engineering change pragmatically to build confidence and create jobs, focusing initially on gathering low-hanging fruit
- Jointly building a new economic model and a new social contract between governments and citizens, so that the two reinforce each other
- Pursuing active policies of integration within the Arab world and within the Mediterranean space, with the active collaboration of the international community

Progressing simultaneously on all four principles is key for ensuring the success of the transition process.

The first three chapters of this report have established the key parameters of the proposed new development strategies. Chapters 4–7 will discuss in detail current issues and possible actions related to the four policy pillars of the knowledge economy. Chapters 8 and 9 will deal with the promotion of economic sectors and local and regional developments that offer a high potential for diversification and growth.

References and bibliography


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7 The Gini index of distribution of per capita domestic income among the countries of the region is 54 percent (World Bank [2010] and author’s computations, excluding for Palestine and Somalia, based on the distribution of the GDP per capita across the region).


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Chapter 4
Improving governance and the business environment

Weak economic governance is the single greatest hindrance to economic and social development in the Arab world and the main factor limiting the progress of the knowledge economy. Economic reform cannot yield its potential without effective, transparent, and credible rules. Shortcomings in the overall governance framework, characterized by pervasive corruption and a lack of voice and accountability, have exposed key economic institutions in Arab countries to capture by vested interests, undermining their quality and credibility. This has reduced the effectiveness and fairness of policies, distorted competition, and most importantly, negatively affected growth and employment. The lack of accountability and transparency and the large gap between de jure and de facto rules have further increased the potential for discretion, favoritism, and corruption (CMI, World Bank, and IsDB 2012).

Although the problem is hard to quantify, enterprise surveys and international indicators, such as the Worldwide Governance Indicators (WGIs), confirm the seriousness of the issues. Governance rankings for the Middle East and North Africa (MENA) stayed at or below the 50th percentile between 2005 and 2010 (figure 4.1). During this time period, the region maintained its rankings on rule of law, but experienced deterioration on voice and accountability and on political stability. The latter are not surprising, given the events that began in December 2010 and heralded the beginning of the Arab Spring. These uncertainties in the policy-making environment should not be understated as concerns for private sector investors and entrepreneurs, who are key in the process of value addition and job creation. The current transitions offer a unique opportunity to address deep-seated governance challenges.

Strengthening governance and the functioning of the state

Participation in the management of knowledge-based development requires credible political regimes that are accountable to the people. The political form that best responds to that description is democracy. In this regard, data from the Polity IV project show that just one country in the region (Lebanon) has an institutionalized democratic regime. The region as a whole scores -3 on a scale of -10 to 10. The Gulf Cooperation Council (GCC) countries have a collective score of -8.7 on the same scale (CSP 2011).

Success of the model depends in large part on government effectiveness, which remains low in the region (except in the GCC countries). An effective government ensures the best use of available resources to improve the economy’s competitiveness, the outcomes from training and public research, and the modernization of the state. Figure 4.2 shows a clear relation between government effectiveness and performance in the knowledge economy (based on the 2012 Knowledge Assessment Method.

1. This chapter draws extensively on Zeidane (2012).
3. The data are for 2010, before the Arab Spring.
The mean percentile of the region on the indicator of government effectiveness was 35 percent in 2009 (the middle of the fourth decile). The Gulf states appear to be the most effective (between the sixth and Qatar’s position in the ninth decile), followed by Tunisia (65 percent), Jordan (63 percent), and Morocco (51 percent).

Decentralization favors the success of local initiatives and stimulates competition among localities. Decentralization is particularly relevant for the region in view of the growing urbanization and spatial disparities in development within countries. There was a trend toward progressive decentralization across the MENA countries over the past decade, although decentralization was viewed as an administrative technique—closer to deconcentration—rather than as a political process. Still, it has resulted in a modest increase in the autonomy of local government in planning and decision making (Bergh 2010). With decentralization, however, special attention must be paid to the effectiveness, transparency, and accountability of institutions.

Civil society is a change agent and has a major role in the management of knowledge-based development strategies. Although the situation varies from one Arab country to another, civil society remains underdeveloped in the region. On the World Bank’s indicator of voice and accountability, no Arab country exceeds the median percentile (figure 4.3). This critical dimension for the involvement of various social actors and for governance as a whole deserves a high priority.

The emergence of a dynamic private sector—operating in a fair, transparent, and competitive environment—is critical to productivity and innovation. The uneven implementation of economic policies has reinforced inequality and the perception of injustice. Rent-seeking and capture of the state by elites have flourished in this environment of privileges and patronage. This has allowed small groups to dominate the market, with low productivity and no incentive to innovate, stifling economic and job opportunities. As shown in World Bank reports, this state of affairs has weighed on the development of a knowledge-based and competitive economy. It is important to correct these imbalances and the underlying governance deficiencies to restore the confidence of economic operators. Strengthening the mandate and independence of key economic institutions, such as competition and tax enforcement agencies, is critical.

4. To measure the knowledge economy, we used the Knowledge Economy Index (KEI) scores (which range between 0 and 10). To measure governance, we used the country’s rank in the WGI (which range between 0 for the worst performer and 100 for the best performer). The government effectiveness indicator reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies.

5. Indicators on governance, when source is not specified, are derived from the WGI Database (2010).

6. For example, see the Tunisia Development Policy Review (World Bank 2010a) and the MENA flagship report From Privilege to Competition (World Bank 2009a).
it possible to establish the credibility of policies and to channel the expectations of economic actors, notably firms, toward the selected targets; (ii) performance-based public financial management\textsuperscript{7} to ensure the effectiveness and efficiency of public expenditures (for example, in the area of education, the infrastructure needed to make the economy competitive, or in support for innovation, with special attention to the system for awarding public contracts to encourage competition and technology transfer); and (iii) an effective public administration managed on the basis of merit and not on political favoritism or nepotism. An effective government ensures the best use of available resources to improve the economy’s competitiveness, the outcomes from training and public research, and the modernization of the state.

\textbf{The rule of law is essential if knowledge economy actors are to have confidence in national institutions}. The rule of law, even though the details of the concept may vary according to local context, is a pledge that institutions will function as they should. Because institutional development is a decisive factor for foreign direct investment (FDI) and efficiency, the establishment of the rule of law is critical for productivity-driven growth. The World Bank’s global rule-of-law indicator, which is a component of the Knowledge Economy Index (KEI), places the region in the middle of the fourth decile, with regional subgroups ranked as follows: GCC (62nd percentile, with Qatar among the top 20 percent of countries), the Mashreq (51st percentile), the Maghreb (39th percentile, pulled down by the poor performance of Algeria), and the others (6th percentile) (World Bank 2010b).

\textbf{Corruption is very damaging for society as a whole and for the knowledge economy in particular}. It erodes credibility and inhibits private initiative, particularly FDI by firms concerned about their reputation. It erodes domestic economic performance by interfering with markets; discouraging private investment and hobbling competition, the engine of innovation; and lowering supplies of basic services, including education and basic infrastructure. It creates instability that is harmful to the long-term development of economies. On the indicator of control of corruption, the region as a whole scores in the fourth decile. The subgroup of the GCC countries is in the seventh decile, with Qatar and the United Arab Emirates (UAE) in the top quintile, followed by the Maghreb (World Bank 2010b). Most of the region’s countries have signed and ratified the United Nations Convention against Corruption (UNCAC).\textsuperscript{8} But the actual implementation of anticorruption legal frameworks is still weak. Essential steps to limit corruption include the simplification of administrative formalities (thus reducing the contact between individuals and government officials), transparency in public procurement, establishment of independent auditors and regulators, and regular publication of information.

\textbf{Security is essential for knowledge- and innovation-driven development}. Without security it is difficult to ensure basic services, domestic mobility of the factors of production, or the proper functioning of authorities, and launching a transparent regulatory review to reduce discretion and anticompetitive behaviors, can build the confidence of investors (CMI, World Bank, and IsDB 2012).

\textbf{Success of the model depends in large part on government effectiveness, which remains low in the region} (except in the GCC countries). Several factors are critical for the approach to succeed: (i) strategic guidance of the development process, which makes

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{fig4.3.png}
\caption{Voice and accountability rankings of selected countries of the region, 2010}
\end{figure}

\textit{Source: Kaufmann, Kraay, and Mastruzzi 2010.}

Note: The governance indicators presented here aggregate the views on the quality of governance provided by survey respondents (enterprises, citizens, and experts) in industrial and developing countries. These data are gathered from survey institutes, think tanks, nongovernmental organizations, and international organizations. The WGIIs do not reflect the official views of the World Bank, its executive directors, or the countries they represent. The indicators are not used by the World Bank Group to allocate resources.

\textsuperscript{7} Public financial management in 12 countries of the region was evaluated under the World Bank’s Public Expenditure and Financial Accountability program. For the six for which data were available, the average score was 2.2 on the 1 to 4 scale developed by De Renzio (2009), corresponding to a grade of C or C+, far behind the practices of the Organisation for Economic Co-operation and Development (OECD) countries.

\textsuperscript{8} The only UN members in the region that have not yet signed are Oman and Somalia.
markets. When an economy depends on overseas markets to buy its domestic production or to supply factors of production (capital, labor, or technology), security is indispensable. Recent changes have lowered some countries’ rankings on political stability in the short term, given the high cost of the recent revolutions in terms of human lives, but the same changes should reduce the likelihood of violence in the medium and long term, provided political, economic, and social measures are taken to address the causes of the revolutions, particularly limitations on freedom, corruption, unemployment, injustice, and inequality. Given the region’s geostrategic position and its natural resource wealth, widespread violence could have very negative implications for the world economy.

Opening up societies

This strategic approach to the knowledge economy, as well as its implementation through the promotion of creativity and the dissemination and use of new ideas, requires guarantees of individual and collective freedom. The region’s Achilles heel is the very low degree of freedom of thought, information, association, and the overall lack of free choice of local and national representatives. According to the indicators of civil and political freedom developed by Freedom House, no Arab country is considered as free. Only Tunisia, Morocco, and Lebanon are classified as partly free (Freedom House 2012). Freedom of thought and expression is not only essential for creativity and intellectual fertilization, but also for quality public policy. Its curtailment in the countries of the region has created a form of group thinking in which the elites settle into supporting the existing political regime and raise no objection to government decisions, no matter how inappropriate. Those who wish to preserve their freedom of thought often have no choice but to emigrate. The Arab Spring, however, created a favorable new context. Notable progress has been made in countries such as Libya, Egypt, and Tunisia. The latter two have conducted elections that observers deem competitive and credible, and freedom of expression has gained momentum in Arab societies. These gains are offset, however, by a decline in civil liberties in countries such as Bahrain, Saudi Arabia, Syria, and Yemen (Freedom House 2012).

Freedom of information is essential to the dissemination of knowledge and the improvement of governance. The citizen’s right to information is rarely codified. Few Arab countries have liberalized their radio and television industries, and governments continue to control the existing public media (not seen as public services), which are often monopolies, although Arab cable channels have experienced considerable growth and played a major role in the quest for liberty of Arab youth. The 2011–12 Press Freedom Index of Reporters without Borders shows that Morocco is 138th out of the 179 countries ranked. Tunisia, which proclaimed its commitment to the information society, is in 134th place and was 164th a year before (Reporters Sans Frontières 2012). Internet censorship is widespread in the region, with seven countries, which together account for 44.2 percent of the population, deemed inimical to press freedom or under watch in the classification of Reporters without Borders. Among the seven are Tunisia and Egypt, which paradoxically have just undergone revolutions that succeeded in part thanks to the use of Web-based social networks to get around restrictions on press freedoms (Reporters Sans Frontières 2011). Needed reforms include liberalization of the media, openness to competition in radio and television, transformation of public media into public services, and elimination of censorship.

Overly rigid restrictions on immigration can inhibit inflows of international expertise and trade in services. The Arab world is the only developing region that is a net importer of migrants, with 7 percent of the population coming from abroad—more than double the world average. There are wide disparities within the region, with immigrants representing 87 percent of the population in Qatar and close to zero in Egypt. Migration allows countries to import skilled labor that is not available locally and, in so doing, to build up human capital and improve productivity. Currently, the percentage of immigrant labor with some higher education is about 15.8 percent, a relatively low level that suggests most immigrants work in occupations with a low technological content. Here, too, intraregional disparities are great. Qatar attracts a larger share of skilled labor (64 percent of immigrants have some higher education), and Libya attracts a lower-than-average share (7 percent). The average number of countries whose nationals need a visa to enter the region is 150 (World Bank 2009c). The cost of travel documents is relatively low in relation to per capita gross domestic product (GDP) and does not constitute a major constraint on mobility (Neumayer 2006).

Gender disparities in the region retard development and are an outward sign of resistance to progress. The participation of women in political life generally helps to improve the credibility and effectiveness of public institutions, and thus the enabling environment for the knowledge economy (World Bank 2004). Women’s participation in the region remains low; the rate of women’s participation in parliament averages 10.6 percent for the region. But changes are taking place: Algeria recently became the first and only Arab country where women hold more than 30 percent of the seats in parliament. In Tunisia and Iraq, women hold more than 20 percent of the seats in parliament; in Qatar, Saudi Arabia, and Kuwait there are no.

9. The 2011 World Development Report deals with the link between security and development, and presents literature on the computation of the costs of security incidents in several regions of the world in terms of economic growth and the prevalence of poverty, which is more than 50 percent higher in countries with serious violence than in countries with a low level of violence. The report emphasizes that the principal causes of violence are the perception of injustice and unemployment: 39 percent of participants in rebel movements trace their involvement to idleness, compared with 13 percent who cite belief in a cause (World Bank 2011).

10. A World Bank report on migration from the Middle East and North Africa (MENA) region to the OECD countries reveals, through the use of a gravity model, that the absence of political liberties is an explanatory variable for the rate of emigration (World Bank 2009b).

11. This sharp increase—from 7.7 percent in 2007—was due to an Organic Law that requires between 20 and 50 percent of the candidates for parliament to be women (http://www.ipu.org/partline-e/reports/2003_E.htm).
women in parliament. The presence of women in high government posts and in certain occupations such as justice and local administration remains very limited in the region.

Despite noticeable progress in the levels of female education, women’s participation in the labor force remains extremely low. The situation remains worrisome; the labor force participation rate of 25 percent (World Bank 2012b), the lowest of any world region, has a concomitant effect on economic growth. This low rate of participation is estimated to have held back growth in per capita GDP by 0.7 percent during the 1990s—a missed opportunity equivalent to 40 percent of the growth achieved during the period (World Bank 2004). As figure 4.4 shows, most of the countries where women have high levels of participation are either resource-rich countries with a large number of expatriates (such as Qatar [87 percent], UAE [81 percent], and Kuwait [68 percent]) (Baldwin-Edwards 2011) or have a high level of women working in the agricultural sector (for example, Sudan, Comoros, and Djibouti). In other words, women’s participation consists of either nonnational workers or national workers in vulnerable jobs.

But female employees seem to be increasingly valued by multinational companies, which see them as more accurate and dedicated than male employees in the MENA region (figure 4.5). This is an interesting finding for Arab countries as they seek to attract more FDI. Box 4.1 highlights Jordan’s New Opportunities for Women (Jordan NOW), a pilot program to catalyze female employment that could serve as an inspiration for other countries.

An open society eliminates constraints on the participation of young people in development. The region’s population aged 15–29 years was 125 million in 2010 (e4e, IsDB, and IFC 2011), up from 67 million in 1990 (Wrigley 2010); youth account for more than 30 percent of the total population and around 50 percent of those of working age. The trend in the MENA region is toward a high rate of youth unemployment, 25 percent on average, with particularly high rates in Tunisia (30 percent), Saudi Arabia (28 percent), Jordan (27 percent), and Egypt (26 percent). Meanwhile, dropout rates are high, leaving a large segment of youth without education, at risk of falling back into illiteracy, and lacking any particular skill. Youth also lack opportunities to build their skills through volunteering or community service. In addition, most skills development programs target urban youth and involve only large private firms, even though small and medium-sized enterprises (SMEs) represent a significant share of employment and production in the region (Angel-Urdinola, Semlali, and Brodmann 2010). Workers without skills cannot contribute to the accumulation of human capital required for the knowledge economy.

![Figure 4.4](https://www.worldbank.org/en/publication/wdr2016/figure/figure-4.4)

**Figure 4.4**

**Women’s participation in the labor force, select countries, 2012**

- **Iraq**: 14.3%
- **West Bank and Gaza**: 14.7%
- **Algeria**: 14.7%
- **Jordan**: 15.3%
- **Saudi Arabia**: 17.4%
- **Lebanon**: 22.5%
- **Egypt, Arab Rep.**: 23.5%
- **Yemen, Rep.**: 24.8%
- **Tunisia**: 25.3%
- **Morocco**: 25.9%
- **Oman**: 28%
- **Mauritania**: 28.4%
- **Libya**: 30.4%
- **Sudan**: 30.8%
- **Comoros**: 34.7%
- **Djibouti**: 35.5%
- **Bahrain**: 39.2%
- **Kuwait**: 43.3%
- **United Arab Emirates**: 43.7%
- **World**: 51.1%
- **Qatar**: 52.1%

Source: World Development Indicators.

13. Also see Hewlett and Rashid (2010).
14. The perception survey conducted in five countries of the region gives levels between 35 percent and 40 percent (e4e, IsDB, and IFC 2011).
Chapter 4: Improving governance and the business environment

Catalyzing female employment in Jordan

In Jordan only 17 percent of women between the ages of 20 and 45 work, compared with 77 percent of men. This labor force participation gap also holds among the more educated; among community college graduates it starts immediately at graduation.

The Jordan New Opportunities for Women (Jordan NOW) is a pilot program meant to rigorously evaluate the effectiveness of two policies: short-term wage subsidies and employability skills training. Short-term wage subsidies give firms an incentive to take a chance on hiring young female graduates and an opportunity to overcome stereotypes by directly observing the young women working for them. In the pilot, each voucher has a value equal to the minimum wage for six months.

Employability skills training augments the technical skills that graduates learn in community college with the practical skills to find and succeed in employment. Many employers say recent graduates lack these interpersonal and other basic job skills. In the pilot, students received 45 hours of instruction in team building, communications, presentations, business writing, customer service, résumé writing, interviewing, and positive thinking.

There appears to be strong demand for these policies. Despite low employment rates, the majority of recent female graduates want to work: 93 percent say they plan to work after they graduate, and 91 percent say they would like to work outside the house even after they are married. Those who began the courses gave them positive reviews, claiming the courses had given them much more confidence to begin searching for jobs. Four months into the wage-subsidy program, about a third of those using vouchers had found a job.

Early results from a midline evaluation suggest that job vouchers have significant employment effects: employment rates among graduates who received vouchers alone or vouchers plus training are 55–57 percent compared with 17–19 percent among those who received training alone or received neither training nor vouchers. In all groups, employment effects are higher for unmarried women. Follow-up surveys will determine whether these employment effects of job vouchers are sustained in the longer term and will also focus on other measures of empowerment and changes in attitudes. The surveys will also allow further investigation of the link between marriage and work, given the early findings that married women are less likely to attend the training, less likely to use the vouchers, and less likely to be employed.


Figure 4.5

Advantages of hiring female employees over male employees: A survey of multinational companies


Note: MENA = Middle East and North Africa; OECD = Organisation for Economic Co-operation and Development.
Arab youth tend to feel disempowered in regard to their economic future, and very few participate in social and civic affairs. Young people can be the engines of growth, contributing to both innovation and productivity. Yet they need open and vibrant economies that provide plenty of opportunities into which their energies can be channeled. The MENA region has been unable to create these conditions, despite a decade that saw periods of significant growth; this potential has gradually turned into a cause for frustration. It is not atypical to find youth unsatisfied with the quality or nature of their employment. In a recent study on Moroccan youth (World Bank 2012a), participants reported their work lives were characterized by boredom, long hours, and heavy loads. There is also an element of precariousness to their experience: youth, especially those in the informal sector, work without contracts or job security, their working conditions are poor, and underemployment is common. But the study also finds that youth have a very strong desire to acquire relevant job skills, and are open to learning. It is this optimism and yearning for knowledge that must be tapped. Youth participation in civic affairs is also critical. Yet the voting laws in most countries exclude young people from participation in political life. Overall, there is little structured participation in social and civic affairs, whether at the neighborhood, local community, district, or national level—a situation that should be remedied so that they can be active contributors in economic and social life.

The establishment of a knowledge-based model requires a return to the primacy of knowledge and its owners. This implies working to emphasize the value of talent in society, particularly through packages of incentives, including compensation systems, prices (or subsidies) and erode the competitiveness of economies. More than 35 percent of enterprises consider electrical power a major constraint on their ability to grow.

Youth participation in civic affairs is also critical. Yet the voting laws in most countries exclude young people from participation in political life. Overall, there is little structured participation in social and civic affairs, whether at the neighborhood, local community, district, or national level—a situation that should be remedied so that they can be active contributors in economic and social life.

The persistently large role of the public sector in the economy and the prevalence of anticompetitive practices hinder the competitiveness and innovation of industry. The governments of most of the countries of the region continue to control large enterprises in the industrial production and services sectors, often without insisting on performance-oriented governance (box 4.2). Lax state control pulls down the competitiveness of the region’s economies. More than 42.4 percent of private firms point to the presence of anticompetitive practices as a major constraint to the expansion of their activities, a constraint that discourages innovation. This situation may be due to the existence of barriers to entry or to distortions introduced by funding facilities granted through investment codes or public contracts, by discretionary and discriminatory application of laws and regulations, by the asymmetric diffusion of information, by the existence of monopolies or oligopolies (or by excessive concentration in the economy, in general, with banks controlling other sectors of activity, for example), or by the existence of more or less developed informal sectors.

The business climate remains a major drag on the region’s attractiveness to foreign direct investors, even though significant progress has been made. Drawn by natural resources, in 2009 FDI was equal to 3.3 percent of GDP, one of the highest levels in the world. A large share of that investment went to the energy sector, which represented more than a third of the total FDI in the Mediterranean countries that are part of the Barcelona process (ANIMA 2011). That share would be even larger if the oil-exporting countries were included—particularly the GCC countries, Libya, and Iraq, where many FDIs are linked to the energy sector. FDI in other sectors, including those with the greatest technology requirements, remains relatively modest. Five types of indicators are typically used to assess the business environment.

Enterprise surveys conducted by the World Bank identify the chief constraints on private sector growth in the region as uncertainty about the business framework (policy consistency, application of rules, and so on), tax rates, corruption, access to and cost of technologies, and burdensome regulations.

15. For example, in Algeria, Jordan, Oman, and Tunisia senators must be at least 40 years old.
16. For example, the weight of the state in production is estimated at 30 percent of GDP in Egypt and Tunisia and at least 60 percent in Algeria (ECIPE 2011).
17. For example, electrical utilities, which are often public, often have ill-adapted technology, high production costs, and low efficiency—all of which push up power prices (or subsidies) and erode the competitiveness of economies. More than 35 percent of enterprises consider electrical power a major constraint on their ability to grow.
18. Enterprises that face strong competition are 50 percent more likely to innovate than those that face no competitive pressure (World Bank 2005).
19. The region is the most restrictive in the world: 27.9 percent of survey respondents view the granting of entry licenses or authorizations as a major constraint on investment. The corresponding figure for East Asia and the Pacific is 15.9 percent and for the OECD, 9.7 percent. In addition, FDI is prohibited or discouraged in certain sectors, such as extractive industries, electricity, transport, and even information and communication technologies (ICTs) (Investment Climate Advisory Services 2010).
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In the World Bank and International Finance Corporation’s (IFC’s) Doing Business Report for 2012, the Arab world as a whole earned a composite score equivalent to that of the 103rd country in the rankings (with a total of 184 countries ranked in 2012), behind Southeast Asia and Latin America. But the differences between the MENA subregions were pronounced. The GCC countries had an average score of 39, far ahead of those of the Mashreq (111) and the Maghreb (112). Marked differences could also be found in scores on the various indicators that go into the overall ranking. The lag is greatest with respect to bureaucracy, building permits, contract enforcement, protecting investors, State-owned enterprises and the business elite

A new set of entrepreneurs grew out of the opportunities fostered under the strong governments that held sway from the 1960s. Then, administrations in almost all countries in the region embarked on ambitious programs of state intervention in all sectors of the economy, including investments in newly nationalized state-owned enterprises in priority sectors—often in heavy industry, and also in light manufacturing. This was the case in then-socialist countries—including Algeria, Egypt, Iraq, and Syria—and in more mixed economies such as the GCC countries of Jordan, Morocco, Tunisia, and the Republic of Yemen.

The private sector was largely repressed during this period, but niches of opportunity remained in the “shadows” outside state control. The few entrepreneurs who exploited such opportunities enjoyed large returns. This was a time of record growth and public investment. It was also a time of heavy regulation across all sectors. The combination of the two enabled a network of businessmen to expand in monopolistic and protected environments.

Many beneficiaries of the policies of that time are still on the business scene today, constituting a large part of today’s business elite. As opposed to the experience of other economies in transition, reforms and increased openness have done little to drive previously protected and privileged entrepreneurs out of business. This has important implications for the relationship between the state and the private sector. Because the old business elite remain prominent in private sector organizations and in formal and informal advocacy groups, the public-private dialogue in most MENA countries is dominated by a few.


FIGURE 4.6
Leading constraints on MENA firms

Simple average of percentage of firms in a given country ranking a constraint as “major or severe”


Note: MENA = Middle East and North Africa.

20. Authors’ calculations in this section are based on the indicators of the Arab countries for which data are available in Doing Business 2012 (all the Arab countries excluding Somalia and Libya).
and labor market flexibility. For example, starting a business required an average of 8.3 procedures in the region in 2011, more than twice the number in North America, with Algeria scoring the worst, at 14 procedures, and Saudi Arabia the best, at 3. That performance partly explains the low rate of creation of formal businesses in the region, which has among the lowest business densities of any world region\textsuperscript{21} (World Bank 2009a). Contract enforcement required an average of 45 procedures, the highest of all world regions.

As mentioned in chapter 2, the region’s average ranking on the Global Competitiveness Index (WEF 2010) is 66 out of 142, with intraregional variances similar to those found in the Doing Business Index. The GCC countries turned in their best performances, with an average rank of 27, and Qatar landed in the top 15, followed by the Maghreb at 84 (because of the poor competitiveness of oil exporters Algeria and Libya and despite Tunisia’s rank of 40) and the Mashreq at 88. The World Bank’s Quality of Regulation Index, part of its World Governance Index,\textsuperscript{22} places the region (as an average of the country scores) in the 35th percentile in 2010. As for the preceding indexes and indicators, the GCC countries, in the 70th percentile, are far in front of others in the region thanks to their reforms of the business environment, followed by the Mashreq (43 percent) and the Maghreb (36 percent), the latter pulled down by the poor performance of its oil producers, even as the rest of the region advanced (figure 4.7). In addition to overregulation of the economy, one of the negative characteristics of the region is the unpredictable application of regulations, as evidenced by enterprise surveys in which a large share of respondents voice this complaint (for example, more than half of all respondents in Algeria and Morocco).

To attract FDI in a context that does not favor reforms, special investment zones have proliferated. International competition for investment, the difficulty of carrying out coordinated reforms to increase competitiveness, and the demands of some investors (sometimes looking to capture rents) all concur to encourage governments to create special zones that will appeal to investors. Such zones enjoy the benefit of simplified administrative procedures (such as a single window), better infrastructure, enterprise clusters, centers for research and training, and direct or indirect subsidies, notably through tax exemptions. Zones are organized into economic cities (Saudi Arabia), special economic zones (Egypt and Jordan), competitiveness clusters (Tunisia), or free zones (Dubai, the UAE, and Tangiers, Morocco). These are discussed further in chapter 9.

Access to financing remains a major constraint on the knowledge economy. In fact, it is among the leading constraints in the countries of the Maghreb: the most problematic factor for doing business in Morocco (18.6 percent), and the second in Algeria (at 16.4 percent) and Tunisia (at 11.9 percent) after bureaucratic inefficiency (WEF 2011). The situation is even more serious for SMEs, which received only 8 percent of the loans made by the region’s banks (Rocha and others 2010). The fact that the financial landscape is largely dominated by the banking system is a key impediment to the financing of innovation (figure 4.8). The perception of limited access to financing is reinforced by the low percentage of private sector credit as a share of GDP—about 48 percent in the region, compared with

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure4.7.png}
\caption{Select country rankings on the Quality of Regulation Index, 2010}
\end{figure}

Note: GCC = Gulf Cooperation Council.

\textsuperscript{21} The ratio of the density of new businesses per person is between 1 and 3 in Algeria, Morocco, and Tunisia.
\textsuperscript{22} This indicator is used in the computation of the Economic Regime Index. It uses various primary sources of information on the business climate to arrive at a score.
a world average of 138 percent. This situation reflects the lack of financial depth\textsuperscript{23} in the region (73 percent in 2009, against a world average of 110 percent). This is due in part to the low rate of bank use among the population, almost nonexistent access to international capital markets, and the poor quality of financial intermediation (as evidenced, for example, by an 8.3 percent rate of doubtful loans compared with the international average of 3.5 percent)—in a context characterized by insufficient information on businesses and markets, inadequate legal protections for lenders, and steadily growing opportunities for state financing. Venture capital, while growing, is still relatively limited and focused more on development than on providing the seed money and start-up funding needed to support innovation (see chapter 6).

Corporate governance is a determining factor in the acquisition and use of knowledge. Large private firms have a weak presence in the region’s economy, which is dominated by parastatals. In a setting where shareholders tend to be family members, the average education of business leaders is limited, as is the requirement for long-term performance, which makes it less likely that these leaders will give a high priority to the knowledge economy. Lack of transparent accounting is one of the impediments to accessing financing. The effectiveness of corporate governance in providing strategic guidance toward growth and stimulating innovation is limited by asymmetry of information, with management often close to the majority shareholders, and the absence of international influence as manifested, for example, by the inclusion of international experts on corporate boards, as occurred in South Korea. The recent adoption of the Dubai Declaration on Corporate Governance,\textsuperscript{24} inspired by the Organisation for Economic Co-operation and Development (OECD) principles, is a positive step, the implementation of which deserves special attention in knowledge-driven growth strategies.

Current labor dynamics in the region pose significant challenges to the development of high-productivity sectors. On the labor demand side, the public sector absorbs the majority of the labor force in most Arab countries (figure 4.9) and sets the terms for employment conditions, while the private sector is characterized by low dynamism and high informality. In addition, the countries that are heavy importers of labor tend to favor workers from outside the region,\textsuperscript{25} which attenuates the effect of growth on Arab employment. Unemployment rates, while high, particularly among youth, are lower than the rates of underemployment or employment in unstable jobs—37.1 percent in North Africa in 2007, for example (Radwan 2009). This situation, which has become an explosive social issue in some countries, particularly those with a labor surplus, shrinks demand for education, investment, technology transfer, growth, and, in a chain reaction, public financing for education (Zeidane 2012).

On the labor supply side, data show that most Arab youth would prefer an administrative job in the public sector. More than 50 percent of the youth in Syria, Tunisia, Iraq, Egypt, Jordan, Yemen, and the GCC countries seek jobs in the public sector (Gatti and others 2013). To this end, many choose higher education degrees that are not necessarily relevant to the needs of the private sector but might secure a job in the public sector. In Tunisia about half of university students tend to study humanities and social science, which represents a heavy opportunity cost for the region’s productivity and economic growth. In Morocco 54 percent of the highly educated labor is concentrated in “nonbusiness services”—the only sector dominated by workers with a tertiary education degree (51 percent of the total sector employment) (Taha 2010).

Recruitment practices also play an important role in the mismatch between the supply and demand of labor. Despite the high investments made by young people and their families in education, the signaling value of higher education degrees plays a relatively limited role in employers’ hiring decisions. According

\textsuperscript{23} This indicator represents the sum of money and quasi-money divided by the GDP. Many empirical studies have shown the positive relationship between growth and financial depth.

\textsuperscript{24} Documentation on the MENA-OECD working group on corporate governance is available on the OECD Web site: \url{http://www.oecd.org/document/62/0,3746,en_2649_34813_34473150_1_1_1_100.html}.

\textsuperscript{25} Owing to the preference for Asian labor, the share of Arabs in the foreign population of the GCC countries fell from 72 percent in 1975 to 32 percent in 2002–04 (Kapczuzowski 2006). Thus Arab growth is not raising Arab employment, making intraregional labor mobility an even more important part of any future regional integration strategy.
to Gallup and Silatech (2011), about 30 percent of Bahraini, Yemeni, and Iraqi youth report that jobs are given only to people who have connections. Such recruitment mechanisms limit the potential for dynamic social mobility across different socioeconomic levels because most informal networks are developed within the same social class. The region needs to reform its recruitment practices by encouraging and adopting professional services that can help firms attract the best pool of talent and skills to match their needs. Non-GCC countries score the lowest in terms of meritocracy in hiring (3.5 out of 7), unlike the GCC countries (which scored 4.9) (figure 4.10). The high score of the GCC countries could, however, be due to the large recruitment of expatriate workers.

As in many other countries, in MENA women are concentrated in specific occupations. For example, 2006 data for Egypt show that most women work in agriculture and education (about 60 percent of all employed women), while most men work in transport, retail, tourism, and manufacturing (which are generally better-paid industries) (Gatti and others 2013). Women in MENA are marginalized in terms of stable salaried employment (just 14 percent of full-time workers are women, the lowest of any world region), in corporate management (17.4 percent women), and in stock ownership (18.5 percent, lower than all regions except South Asia). 27

Although in MENA the average employed woman is more educated than the average employed man, female workers generally earn lower wages than men, especially in the private sector. But the estimated gender gap varies significantly from country to country, highlighting the heterogeneity of the phenomenon in the region (figure 4.11). Gaps are much wider in private sector jobs (40 to 80 percent in West Bank and Gaza and Egypt) and—as might be expected—smaller in the public sector. In fact, in West Bank and Gaza’s public sector, women actually

26. Outperforming East Asia-Pacific, Latin America, Europe and Central Asia (ECA), and Sub-Saharan Africa.
27. World Bank Enterprise Surveys.
higher than the world average of 42.8 percent. Merchandise imports were 32.3 percent of GDP. The slightly higher share of exports, and thus the trade surplus, reflects the weight of energy exports in the region’s international trade accounts. When energy is excluded, the region’s exports constitute less than 1 percent of international trade—a measure of the region’s marginalization. Of course, reforms to liberalize foreign trade have been carried out, with reductions in protective tariffs and some improvements in customs procedures and logistics. As a result the average Business Freedom Index in the region (Heritage Foundation 2011), weighted by the size of the economy, stands at 73.2 percent, but the region is one of the most closed in the world.

Tunisia’s economy is one of the most protected—its Business Freedom Index of 53.5 percent reflects high average tariffs (18.3 percent in 2006 and 16 percent in 2008) and the persistence of nontariff barriers (NTBs). The region’s most serious lag is in trade facilitation. For example, on average 28 days are required to complete import formalities, compared with 12 days in the OECD countries. The World Bank’s Logistics Index for the region is 2.7 (on a 1–5 scale), compared with 3.5 for the European Union (EU) and 3.7 for the OECD countries. Further trade liberalization reforms are needed to lower average levels of protection (while still providing a measure of protection for sensitive domestic projects) and to facilitate trade by modernizing customs administration (by universalizing the use of electronic documents), reducing controls (with more selective inspections and better training for customs officials), and implementing structural reforms to improve logistical performance.

The region will have to base its growth and employment strategy on regional economic integration. In 2008 intraregional imports represented only 13 percent of all imports (about half the corresponding level of 25 percent in the developing countries of Asia), although that figure represents a tripling since 1999 (from 4.5 percent), when the Greater Arab Free Trade Area (GAFTA) accord went into effect. This progress occurred despite the complexity of procedures, which are improving slowly (Hoekman and Sekkat 2010). The Maghreb subgroup, with their trade oriented toward Europe, chalked up the lowest level of intraregional trade in the Arab world. Non-oil intra-Maghreb trade averaged less than 5 percent of total subregional trade. Empirical studies show that the current low level of intraregional trade is well below the potential. The GAFTA agreement is limited to the elimination of tariff barriers on manufactured goods and does not affect agricultural tariffs or NTBs in various sectors (which can be high in tariff-equivalent terms). The Arab League should proceed quickly to form a

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28. This indicator is used in the computation of the Economic Regime Index. It is based on the distance from the best average tariff performance (100) before subtracting a number between 0 and 20 (in increments of five), reflecting the assessment of nontariff protection.
29. The results obtained by Kee, Nicita, and Olarreaga (2009) show that the overall trade restrictiveness index, which measures the average level of protection, is relatively high in the region and increases considerably when nontariff barriers (NTBs) are added. For example, Tunisia’s index moves from 0.23 to 0.37 when adding NTBs, and Morocco’s doubles from 0.24 to 0.48. Both are far higher than Turkey’s index of 0.10 (including NTBs).
30. The results obtained by Kee, Nicita, and Olarreaga (2009) show that the overall trade restrictiveness index, which measures the average level of protection, is relatively high in the region and increases considerably when nontariff barriers (NTBs) are added. For example, Tunisia’s index moves from 0.23 to 0.37 when adding NTBs, and Morocco’s doubles from 0.24 to 0.48. Both are far higher than Turkey’s index of 0.10 (including NTBs).
31. Iraq, Mauritania, Somalia, and the Comoros are not yet part of the GAFTA.
32. See De Wull and Maliszewska (2009) for an assessment of the effect of GAFTA membership using a gravity model and for a review of earlier empirical work. This work, as well as Behar and Freund (2011) estimate that the potential for intraregional trade is twice the current level.
33. Estimated to be between 22.1 percent and 35.6 percent for countries of the region that have signed association accords with the European Union (Ghoneim and others 2011).
At the same time, the region will have to accelerate its integration into the global economy. The first target for external integration is the EU, which is already the leading trade partner of the countries of the Maghreb. The countries of the southern rim of the Mediterranean have also entered into agreements of economic association with the EU that grant it preferential trade terms. Those agreements are set to evolve into a free trade zone, although the anticipated date for that evolution passed without substantial progress, and differences on rules of origin and NTBs persist. Resistance on the European side to opening agricultural markets and on the southern side to opening markets in services hurt the chances of concluding a free trade agreement (FTA) anytime soon. In the meantime, the MENA region will have to develop its own Arab neighborhood policy by turning more toward Sub-Saharan Africa, Turkey, Iran, India, and, further still, China and Latin America. Egypt and Jordan have benefited from preferential agreements with the United States under which so-called qualifying industrial zones succeeded in attracting larger flows of FDI, diversifying export markets, and stimulating growth and job creation. Such arrangements should be expanded as they promise to be of particular benefit to countries that succeed in completing their democratic transition. But increasing trade flows with neighboring Europe will require Arab countries to improve governance and invest in new areas of regional collaboration such as education and innovation [FEMISE].

Trade partners share with Arab countries the responsibility for offering an ambitious vision in support of economic and political transition. The Deauville Partnership, launched in May 2011 as a direct response to the Arab Spring, provides new opportunities to create a common economic space spanning the two rims of the Mediterranean, accompanied by a framework and incentives for implementing difficult policy reforms. Key recommendations for the trade partners of MENA countries, as highlighted in the recent Deauville Partnership report on trade and FDI, include the following:

- The EU could deepen its trade relationships with Egypt, Jordan, Morocco, and Tunisia, developed under the Association Agreements and the European Neighborhood Policy, with effective implementation of the proposed Deep and Comprehensive Free Trade Areas (DCFTAs).
- In a coordinated and coherent approach and on the basis of its growing political and economic influence in the region, Turkey could similarly deepen its existing association agreements with each partnership country to foster trade and investment in the agricultural and services sectors and promote labor mobility.
- The GCC could strengthen its relationship with Egypt and Tunisia (Jordan and Morocco have already been officially invited to join the GCC), in the framework of a deepened cooperation with the Agadir agreement. This would allow citizens of member countries to enjoy equal rights and privileges, including the rights to move, settle, and work; receive social protection, retirement, health, education, and social services; and engage in various economic activities and services.
- Consistent and in coordination with initiatives being undertaken by the EU and other Deauville partners, the United States could (i) increase the value of its existing agreements with Jordan and Morocco, and (ii) invite Tunisia and, once the appropriate circumstances are in place, Egypt, and Libya to enter into FTAs as well. These actions could be part of the proposed Middle East–North Africa Trade and Investment Partnership [MENA TIP], which will include a broad set of arrangements designed to increase job creation, trade, and investment between and among the United States and countries in the region.
- Deauville partners could also help promote intra-Arab regional integration and integration of partnership countries into global markets. The Agadir agreement between Egypt, Jordan, Morocco, and Tunisia could be deepened, and Libya could receive the necessary support to join the World Trade Organization (WTO).
- To signal their determination to pursue a coherent, ambitious, and credible vision in support of the political and economic transition of partnership countries, the main Deauville partners could join forces to announce commitments in six areas with high immediate jobs potential (box 4.3).
Conclusion

Sound macroeconomic policies, good governance, and a business-friendly climate provide the basis for knowledge-based strategies, as they do for virtually all development strategies. They are, however, all the more important for the development of a true knowledge economy, since only a transparent and accountable governance system and an efficient business climate can support the creation and diffusion of new ideas and the emergence of a competitive and innovative private sector. Shortcomings in the overall governance framework have undermined the effectiveness of key economic institutions in Arab countries, but the ongoing transitions now offer a unique opportunity to address these deep-seated challenges. Some countries have already initiated key reforms in popular access to information and the involvement of civil society in public policy debates.

These efforts need to be pursued and enlarged to two major areas: the strengthening of government effectiveness and the development of a fair and competitive private sector. At the institutional level, the establishment of the rule of law is critical for productivity-driven growth. Simplification of administrative formalities, transparency in public procurement, and regular publication of information are essential steps toward limiting opportunities for corruption. Because local governments play a key role in the transition to the knowledge economy, current processes of decentralization should be reinforced. Lastly, greater participation of women and youth in the economic and civic life of Arab countries is a necessary condition for the development of inclusive knowledge economies. With regard to the business climate, it will be important to facilitate the emergence of entrepreneurial activity, to reduce bureaucracy in its various forms, to eliminate regulations that stifle initiative, to remove unearned privileges currently enjoyed by groups close to ruling powers, and to improve access to finance. Labor markets need to be reformed, trade channels widened, and exchanges of technology facilitated.

Global and regional integration: Key recommendations to Deauville partners

Agriculture. Improve partnership countries’ access to the agricultural, processed agricultural, and fisheries markets of Deauville partners, particularly for fruits, vegetables, and olive oil. Steps would include the progressive abolition of quotas, reference prices, seasonal restrictions, domestic and export subsidies, and other nontariff barriers (NTBs) to agricultural trade.

Manufacturing. Negotiate mutual recognition agreements, such as agreements on conformity assessment and acceptance of industrial products, between partnership countries and Deauville partners to reduce the market fragmentation effect of technical barriers to trade. This is especially relevant in priority sectors that account for a large part of partnership countries’ exports and employment, such as mechanical and electrical industries and construction materials.

Services. Negotiate specific sectoral commitments on labor mobility between partnership countries and Deauville partners, especially for skilled workers (as part of Mode 4 on the movement of persons in future deep and high-quality trade agreements with Deauville partners).

Energy. Negotiate a multilateral agreement on solar energy imports from MENA that will govern how the parties share the burden of paying for the incremental cost of solar imports. (European subsidies for renewable energy could be made available for imports, with appropriate adjustments.) The agreement could be concluded initially between Morocco and interested EU member states, such as Germany, Spain, France, Italy, and others. Other partnership countries could also be invited to join the agreement, depending how fast they move with concentrated solar power projects.

Migration. Launch labor mobility partnerships or similar mobility schemes between partnership countries and Deauville partners, including visa facilitation for some categories of workers, readmission, concerted border management, and easier access to the job market of the Deauville partners, especially for less-skilled workers from partnership countries.

Intra-Arab integration. Adopt and implement simpler and more liberal rules of origin in preferential trade agreements between partnership countries and Deauville partners, including an improved EU regional convention on preferential Pan-Euro-Mediterranean rules of origin.

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Education is the fundamental enabler of the knowledge economy—beginning with early childhood development and basic education, which provide the foundations for learning, and moving on to secondary and tertiary education, which foster the core skills needed for creative and critical thinking. Beyond this, an effective lifelong learning system is needed to enable people to upgrade their skills throughout their lifetimes to remain competitive in the new global economy.\(^1\)

In recent decades, tremendous progress has been made across the Arab region in widening access to education. But challenges remain as the region positions itself to compete in world markets and to build the skilled human capital needed for its transition to the knowledge economy. The foremost of these challenges is creating work opportunities for an increasingly educated labor force. This chapter briefly highlights aspects of the current education system in the region and underlines some of the areas that need strengthening across all levels to better link education with employment.

**The current situation**

Since the early 1960s, Arab countries have made immense progress in providing equitable access to formal education, fighting illiteracy, and reducing gender disparities. Most countries in the region have achieved full or nearly full enrollment in basic education, and rates of secondary and tertiary education that are equivalent to countries in other regions at comparable levels of development. Moreover, the region no longer suffers from severe gender disparities in secondary and tertiary education. These impressive achievements have improved the quality of life for citizens through longer life expectancy and lower fertility and infant mortality rates.

Notwithstanding these successes—and the considerable resources invested in education—education reforms in the Arab region have not yet fully delivered on their promise. The relationship between education and economic growth remains weak, the divide between education and employment has not been bridged, and the quality of education continues to be disappointing.

For too many students in the Arab world, schooling has not been synonymous with learning. An illustration is the lackluster results of Arab countries on the 1999, 2003, and 2007 Trends in International Mathematics and Science Study (TIMSS) assessments of eighth-graders’ achievements in math and science. Of the 14 countries that participated in the 2007 math test, the Middle East and North Africa (MENA) average was 389, compared with the international average of 451 (on a scaled average of 500). Figure 5.1 shows that countries in the region have been relatively unsuccessful in achieving qualitative improvements in education, as measured by how well students perform on learning assessments. The World Bank’s Education Strategy 2020 notes that a country that increases its reading and math scores from the median to the top 15 percent can expect a significant 2 percent increase in annual gross domestic product (GDP) per capita growth (World Bank 2011a).

\(^1\) This chapter draws on several references, including World Bank (2008) and Ezzine (2009; 2012). Mourad Ezzine, Juan Manuel Moreno, and Simon Thacker provided helpful comments.
Despite heavy investment in education, returns in terms of average years of schooling are modest. The region has invested about 5 percent of GDP and 20 percent of government budgets in education over the past 40 years, registering many gains. But its educational outcomes have trailed those of many competitors. For example, the MENA region needs to do more to catch up with the rest of the world in terms of average years of schooling (for the population aged 15 and above); it registered 7.12 years in 2010, compared with 7.94 years in East Asia and Pacific (EAP), 8.26 in Latin America and the Caribbean (LAC), and 9.65 years in Europe and Central Asia (ECA) (World Bank 2012a).

The MENA region continues to have relatively low rates of secondary and tertiary enrollment. In 2009 the average gross enrollment rate of countries in the region at the secondary level was 75 percent, compared with 78 percent for EAP, 90 percent for LAC, and a high 96 percent for ECA. The average gross enrollment rate for tertiary education in MENA was 28 percent in 2009, the same level as in EAP but lower than the levels in LAC (37 percent) and ECA (58 percent) (figure 5.2).

In more than half of the MENA countries, approximately two-thirds of secondary school students major in the social sciences or humanities, a pattern of enrollment that is the opposite of what is observed in East Asia. The experience of Japan, the Republic of Korea, and Taiwan suggests that if a country is to assimilate technology, one-third or more of its university graduates need to have studied science and engineering at the graduate level (World Bank 2011b). Only 22.6 percent of the MENA students pursue degrees in science, engineering, or technical fields (World Bank 2008). Given the role that technological innovation and adaptation play in the knowledge economy, MENA schools are not yet producing the right mix of competencies. The situation is exacerbated by the fact that a large number of social science diploma holders are unable to find jobs. There is thus a need to reshuffle the orientation of the education system to produce more graduates in technical areas, as well as to adapt the education and training system in social sciences toward greater employability.

The universities of the region are not featured prominently in international rankings, they do not produce significant research, and they have weak links with industry. The University of Alexandria in Egypt is the only university from the MENA region that ranks among the top 400 universities in the world, according to the 2012 Times Higher Education World University Rankings. There is a need to build closer university-industry linkages, both in education to address the demand for skills and in applied research to ensure that research and development (R&D) carried out by universities is related to industry needs. There are some interesting initiatives under way in the Gulf Cooperation Council (GCC) countries: the Education City in Qatar is designed to promote education and research under the triple helix of the university-industry-government model. Saudi Arabia’s 2009 National Science and Technology Plan aims to create a chain of cooperative technology innovation centers, a partnership between private firms (both local and global) and leading universities. In 2011 centers designed to respond to industrially relevant problems were established at three universities: King Fahd University of Petroleum and Minerals, King Saud University, and King Abdulaziz University. Types of university-industry cooperation include joint funding, sharing of resources, and in-kind support (Al-Sultan and Alzaharnah 2012).

Laudable investments in human development have not yet translated into commensurately higher rates of participation by women in economic and political life. Women’s labor force participation rates in the region (at 25 percent) are half the world average and the lowest of all world regions. Women continue to face significant restrictions on mobility and agency; these are underpinned by the legal framework, social and cultural norms, and regulations that restrict work and political participation (World Bank 2012b).

Creating jobs and increasing productivity are at the top of policy makers’ agendas across the world, not least in the Arab world. The Skills Toward Employment and Productivity (STEP) approach provides a simple yet comprehensive way to look at skills development for more jobs and higher productivity (box 5.1) (World Bank 2010a). It also helps to orient the areas of action needed in the Arab world highlighted below.

**FIGURE 5.2**
Secondary and tertiary gross enrollment rates, by world region, 1990 and 2010

a. Secondary gross enrollment rates, 1990 and 2010  

b. Tertiary gross enrollment rates, 1990 and 2010

Source: UNESCO Institute of Statistics (UIS).
Chapter 5: Educating people for better jobs in a new economy

Chapter 5: Educating people for better jobs in a new economy

Improving the quality of education

Educational advances in the Arab world in recent years have been based on inputs—that is, on what the countries of the region have put into schools: more teachers, more schools, and more coverage. But when the focus shifts from “education for all” to “learning for all,” such inputs should be complemented by actions to improve the quality of education, ensuring that students actually learn to read, write, and handle numbers; that they learn to solve problems and think critically; and that they acquire the life skills with which to function effectively as productive economic actors and responsible citizens.

Box 5.1: The Skills toward Employment and Productivity (STEP) Approach

**Step 1:** Developing the technical, cognitive, and behavioral skills conducive to high productivity and flexibility in the work environment—by starting right through early child development, emphasizing nutrition, stimulation, and basic cognitive skills.

**Step 2:** Ensuring that all students learn—by building stronger systems with clear learning standards, good teachers, adequate resources, and a proper regulatory environment. Lessons from research and ground experience indicate that successful systems must answer key questions about how much autonomy to allow and to whom, accountability from whom and for what, and how to assess performance and results.

**Step 3:** Training to build additional job-specific skills that employers demand—by developing the right incentive framework for both preemployment and on-the-job training programs and institutions (including higher education). There is accumulating experience showing how public and private efforts can be combined to achieve more relevant and responsive training systems.

**Step 4:** Encouraging entrepreneurship and creativity—by creating an environment that encourages investments in knowledge and innovation. Emerging evidence shows that addressing the need for creativity, leadership, time management, and communication skills requires innovation-specific skills that can be developed early in life, connecting people with ideas (for example, through collaboration between universities and private companies), and risk management tools, including safety nets.

**Step 5:** Matching the supply of skills with the demand—by moving toward more flexible, efficient, and secure labor markets. None of the first four steps matter if people cannot find jobs that match their skills. Avoiding rigid job protection regulations while strengthening income protection systems, complemented by efforts to provide information and intermediation services to workers and firms, provides the final complementary step in the process to transform skills into actual employment and productivity.

**Source:** World Bank 2010a.

Viewed in this light, all Arab countries, irrespective of their initial conditions, require a shift from managing educational inputs to engineering the education system to obtain better results. Rather than controlling the allocation of educational inputs and resources, Arab governments need to set clear learning and skills-acquisition objectives (as measured by performance on tests, including international tests, and by improvements in employability), to establish incentives to induce an assortment of public and private actors to pursue those objectives, and to coordinate the actions taken. The approach needs to focus not only on improving the technical relationships between the inputs and outputs of education (education engineering), but also on the incentives facing the actors involved (teachers, schools) and on the public accountability of policy makers to citizens.
The purpose of student assessment should be enlarged from its present narrow purpose of selection and academic placement to providing evidence of education quality, evidence that can be used to adjust policy and manage for results (Ezzine 2012). By using assessments to monitor and evaluate the quality of education, educators can make steady adjustments to the curriculum, increasing the relevance of education to market demands and opportunities. Managing for results would also level the playing field for students across the social spectrum, removing the built-in bias in favor of students from the educated classes and those whose families are able to pay for private tutoring. Jordan’s reforms in education that began in 2002 illustrate the improvements made in the quality, relevance, and efficiency of the kingdom’s systems of early childhood, basic, and secondary education (box 5.2).

Investing in early childhood development

Early childhood development (ECD) has been shown to improve learning ability, school performance, and labor market productivity. It is also cost-effective: the earlier the investment, the greater the economic return (Heckman and Masterov 2007). Early development begins even before birth, with prenatal care for mothers. In the critical years up to age three, language and sensory development take hold. Yet these years are largely overlooked by ECD services in MENA countries. Those services that are provided (by both public and private nongovernmental sectors) are fragmented and too thinly spread to achieve the intended learning outcomes. A recent study in Egypt shows that children who receive early childhood education and care are significantly less likely to drop out before completing their primary and early secondary education. The change in educational attainment resulting from the decreased dropout rate is approximately one additional year of schooling (Kraft 2012).

In 2009 only 21 percent of four- and five-year-olds in the region attended preschool, ranging from lows of just 3 percent in Djibouti and 10 percent in Syria to highs of 75 and 79 percent in Algeria and Lebanon, respectively (UIS 2009). Lack of coordination and the poor quality of programs compound the problem of access. ECD services come from a variety of sectors (health, education, social protection), and are delivered by both public and private actors. Public spending is low and services are of poor quality. To the extent that ECD services are provided by the private sector, they typically are limited to families that can pay for them.

What is needed is to raise awareness about the importance of ECD and to scale up proven initiatives. This calls for greater understanding of the importance of setting a foundation for human development in the early years, developing sufficiently nurturing environments at home, providing access to early and quality child care at home or in community centers, and investing in

**Box 5.2 Jordan’s Education Reform for the Knowledge Economy (ERfKE) program**

The ERIKE program in Jordan is a 10-year, multidonor program to deliver comprehensive education reform. The first phase (ERIKE I, 2003–09) focused on general education system reforms. ERIKE II (2006–10) focused on increasing the level of skills necessary for participation in the knowledge economy at all levels of education. In tandem, the Jordan Education Initiative was launched in 2003 under the umbrella of the World Economic Forum (WEF), as a multistakeholder partnership that integrates information and communication technologies (ICTs) into the education process in grades 1–12.

The results of the reforms are tangible. By 2010 Jordan had the highest literacy rate in the Middle East and North Africa (MENA); gross enrollment rates at the primary and secondary levels reached 98 percent and 97 percent, respectively, by 2006; up to 3,000 schools were connected to online learning portals, with 80 percent of schools connected to the Internet; and there was a 37 percent increase in qualified kindergarten teachers with a bachelor’s degree and certification. The target of training 50,000 teachers in basic ICT skills was surpassed: more than 85,000 teachers were trained and 55,000 certified (compared with a baseline of 5,000 trained ICT teachers in 2003). New curricula and teaching methods emphasizing higher-order thinking, critical thinking, and student-centered learning, while other aspects of knowledge-economy-based education were developed.

Assessments of learning show improvements owing to the new curricula, learning materials, and teacher training. The results of the 2008 National Assessment for the Knowledge Economy showed a clear improvement in performances in math, science, and reading. The 2007 TIMSS results showed positive and marginally significant improvements in performance. In science, Jordan improved its regional and international ranking. Although the increase in TIMSS scores from the previous assessment was not statistically significant, Jordan’s regional and international ranking improved consistently during this time period, an achievement unmatched by most other participants worldwide. Between 2003 and 2007, Jordan moved up in the international TIMSS ranking from 25 to 20 in science and from 32 to 31 in mathematics.

The results were achieved in consistent steps that began with a broad consultation process. From that process a national strategy was developed to guide the Ministry of Education. A decision-support system was created to provide timely information on education activities, with 90 percent of decision makers and researchers using the system by 2008. Constant improvements were made to the curricula, learning environments, and broadband connections, the latter through cooperation between industry and the national network.

Source: World Bank 2011c; Bannayan and others 2012.
Developing new skills and competencies

Globalization demands a new and different mix of skills and competencies, creating new demands on education systems. To rise to the challenge of global competition and rapid technological change, students must master a variety of so-called soft skills—problem solving, communication, teamwork, as well as mastery of ICTs and foreign languages—that are essential for employability and productivity.

The mismatch between the skill needs of the economy and the outputs of the education and training system is apparent in the widespread perception in the private sector that lack of skills (especially soft skills) is an important obstacle to their business operations (figure 5.3) [World Bank 2012c].

Unfortunately, most schools in the region do not presently emphasize the development of such skills. Rote learning remains predominant in the Arab world, with little emphasis on problem solving and interactive teaching methods that demand initiative from students. 2 Student assessments in mathematics, for example, in most Arab countries strongly rely on recalling definitions, facts, and concepts, and on applications rather than the ability to think critically. Findings from TIMSS 2007 confirm this conclusion. The TIMSS 2007 asked both teachers and students about the frequency of using memorization in teaching problem solving in mathematics. The overwhelming majority of Arab eighth graders said that they memorized formulas and procedures in about half their mathematics lessons or more. This high percentage varied between 57 percent in Algeria and 84 percent in Jordan as compared to 48 percent for Chinese Taipei, the best-performing country in TIMMS 2007 in mathematics (figure 5.4) [Faour 2012].

Educational reform must include retraining teachers and redesigning the curriculum all the way from basic to higher education to facilitate transformation toward the knowledge economy. Governments need to carefully consider how every investment will contribute to improving the education process, including how teachers are trained and whether they are trained in the inquiry-based and interactive teaching methods that students need today. Jordan, Tunisia, and Lebanon have progressed the furthest in student-centered pedagogy, inspired by international trends to include innovations in their curriculum and textbooks, in-service teacher training, and equipping schools with Internet connections and computers [World Bank 2008]. The curricular reforms being undertaken in Malaysia and Singapore offer examples for MENA countries interested in making such changes (box 5.3).

The transformed global economic climate therefore demands that Arab governments rethink how their education systems can be reformed to better respond to the needs of the economy by producing competent and flexible graduates who possess the skills and expertise needed to compete in a world where knowledge is essential to progress. The Arab Knowledge Report 2010/11 analyzes the process of preparing young Arabs for the knowledge society and proposes a model for action based on the triad of skills, values, and an enabling environment (box 5.4).

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Technical and vocational education and training (TVET) has traditionally been the poor cousin of the education family. In the knowledge economy, however, TVET’s role is quickly changing to become the revolving door for skill renewal and requalification. In the MENA region, preservice TVET programs have been relatively unsuccessful in linking training with employment. Furthermore, as preservice TVET is usually the reserve of those who have not done well in compulsory education, many students do not have a firm grasp of the basic skills needed to learn more challenging technical competencies. Also, preservice TVET largely fails to put students on a clear pathway to further education and training options. It is also rare for TVET students to pursue studies at universities. Some countries such as Jordan, Syria, West Bank and Gaza, and Yemen have some tertiary education options in technical and vocational fields, although these are restricted to a narrow range of students [World Bank 2008].

Although students’ choices following completion of compulsory education have increased in MENA countries in recent years, transferability between different types of academic institutions remains limited. Few students have the option of pursuing higher education at the university level after opting for vocational and technical education. Exceptions include Jordan and Tunisia, 3 which, having developed nonformal vocational training programs to respond to employers’ training needs, are now developing formal options to better meet labor market needs through short-track postsecondary programs in technology, business, or trades, most of which require two years of study.

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2. In 1995 a research study on education quality in the MENA region showed that students were instructed in how to learn and retain “answers to fairly fixed questions in problem situations with little or no meaningful context,” and that the education system tended to reward passive knowledge recipients. Although the study is out of date in some respects, many of its findings still hold: higher-order cognitive skills such as flexibility, problem solving, and judgment remain inadequately rewarded in the region’s schools [World Bank 2008].

3. In Tunisia postsecondary technical education is provided in the country’s system of Instituts Supérieurs des Études Technologiques.
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**Figure 5.3**
Share of firms identifying lack of skills as a business constraint

![Graph showing the share of firms identifying lack of skills as a business constraint across various countries.](image)


**Figure 5.4**
Rote learning of mathematics in MENA

![Graph showing the percentage of students who reported memorizing formulas and procedures in at least half of their mathematics lessons.](image)


Note: MENA = Middle East and North Africa.
For TVET to become more effective, it will be important to improve governance, find new sources of funding, and introduce greater participation, accountability, and decentralization in public provision. In most countries of the region, the state plays a predominant role in financing and delivering TVET. Initiatives to include business and union representatives in governance have for the most part relied on the establishment of ad hoc national committees with nominal representation of various stakeholders, and in practice, have proven to be largely ineffectual. In terms of accountability, public provision of TVET in the region is not based on performance or outcomes. In the presence of guaranteed public subsidies, the incentive for change and relevance is weak. New funding mechanisms that would operate alongside or in place of traditional direct allocations could encourage public providers to respond better to the needs of individuals and businesses. Private sector contributions to TVET will need to increase to sustain a more diversified provision of TVET services of higher quality.

**Preparation of future generations for the knowledge society**

The Arab Knowledge Report 2010/11 sets out three core principles for educating future generations for the knowledge society. The document reports on field surveys conducted on a pilot basis in four Arab countries: Jordan, Morocco, the United Arab Emirates (UAE), and Yemen. The surveys investigate the triad of the skills, values, and enabling environments of Arab youth in these countries. The findings reveal poor results among the student sample in cognitive skills (searching for and processing information, written communication, problem solving, and the use of technology) compared with social skills (communication with others, teamwork, and participation in public life) and noncognitive abilities (self-esteem, motivation for learning, and planning for the future). At the level of values, the results reveal that students’ values generally qualify them for the knowledge society. A gender-based comparison shows that girls tend to score better than boys. While the enabling environments of students and their teachers seem to lack several basic components, other components, particularly the family’s role in preparing the young, are positive.

The report suggests a strategy for preparing future generations that includes four aspects of action: willingness to act (political, social, innovation), ability to act (including addressing political, legislative, and social impediments), how to act (building and adopting appropriate methodologies and approaches), and the prerequisites for action (institutions, social, economic, and financial). It concludes that there is an urgent need to set Arab countries on a fast track to the knowledge society by unleashing the potential of their people and institutions for learning, freedom, and development. Doing so requires an Arab renaissance built on a comprehensive process of economic, social, political, and cultural mobilization.

**Source:** UNDP and Maktoum Foundation 2012.
Accountability, incentives, and governance: The keys to stronger education systems

Strengthening the education system depends on successfully aligning its governance, management, financing, and performance incentives to produce better learning outcomes, as articulated in national policies and measured by local, national, and international assessments. Strengthening the system also depends on replacing accountability to the state with accountability to the public. Well-performing educational systems know how to respond to the admittedly complex demands of their diverse clientele—governments, parents, students, staff, employers. Three areas for improvement are highlighted below.

4. In MENA accountability has usually been organized by governments in the form of consultative events, parliamentary oversight committees, advisory committees, or nongovernmental representation in oversight agencies. In other regions, civil society has supplemented such mechanisms with advocacy and “watchdog” organizations, specialized journals, independent research institutes, and professional associations. Similar moves are starting to appear in the MENA countries and should be recognized and encouraged.


Box 5.5 Assessing university governance: A benchmarking tool

The “University Governance Screening Card” responds to the need for a tool to benchmark the governance of higher education institutions in the MENA countries. The screening card makes it possible to assess whether universities in the region are following good governance practices aligned with their institutional goals. It does not impose a particular model of good governance, but allows universities to compare themselves with other institutions and to monitor their progress over time. To date the screening card has been tested in 40 universities in Egypt, Tunisia, Morocco, and West Bank and Gaza. Six other countries—Algeria, Bahrain, Iraq, Kuwait, Lebanon, and Sudan—have shown an interest in participating in the project.

The screening card encourages meaningful change by raising awareness of governance concepts within institutions and revealing gaps between self-perceptions and results based on the questionnaire. Another key takeaway from the scorecard is the difference between perception (blue area) and reality (red area): overall, universities perceive that they are more autonomous, have more clearly defined mission statements, have better levels of participation among stakeholders, and are more accountable than what is revealed by the test.

This scorecard is a first step toward developing a more comprehensive tool to monitor university performance, providing an entry point for assessing other dimensions such as quality assurance, student learning outcomes, quality of teaching and research, and employability of graduates.

Source: Jaramillo 2012; Altbach and Salmi 2011.

Setting targets and measuring progress toward those targets

It is hard to know whether you are making progress unless you have a goal and a way of measuring advancement toward that goal. Every MENA country would be well advised to adopt national performance standards at all levels of education (as touched on in the section on improving the quality of education), and to continuously monitor progress toward meeting those standards. One way to do that is to set targets for average national performance on one or more of the major international testing programs, as Brazil has done, and require each school to develop a plan for improvement consistent with the established goal.

In higher education, quality assurance and certification mechanisms need to be developed at the national and regional levels. Egypt, for example, has adopted a strong approach to external quality assurance in the face of growth in private higher education. Initiatives include World Bank–financed quality assurance and accreditation projects, the establishment of the National Authority for Quality Assurance and Accreditation of Education,

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<td>Source: Jaramillo 2012; Altbach and Salmi 2011.</td>
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and the development of national academic reference standards for various fields of university study. Much of the necessary groundwork has been laid; quality assurance documentation has been developed and made available to academic staff of higher education institutions, training and professional development opportunities have been provided, and assuranc es have been given that strong performance will be recognized and rewarded. But important work remains to be done at the institutional level in moving beyond compliance to nurture a culture of quality and management capacity (OECD and World Bank 2010).

A culture of quality and good institutional governance go hand in hand. Both are essential to ensure better outcomes [World Bank 2011a]. Altbach and Salmi (2011) highlight that important factors for successful world-class universities include leadership, government policy and funding, the ability to continually focus on a clear set of goals and institutional policies, development of a strong academic culture, and quality of academic staff. One way to improve governance is through scorecards that can be used to evaluate the governance strategies employed by higher education institutions in the region and their progress toward policy goals (box 5.5).

Gathering and disseminating information about school outcomes

When parents, taxpayers, and policy makers know how the education system is performing, they are better equipped to ensure that public financing is producing desired outcomes. Educational information systems tend to be weak in the MENA region. Basic information on student outcomes, attendance, dropout rates, teacher absenteeism, and teacher training and qualifications is not readily available to education officials, let alone the public on a timely basis. The weakness appears to reflect a lack of political will to disseminate information about school performance to parents and stakeholders. More than a technical incapacity to measure outcomes, this lack of will is a major obstacle to successful reforms.

Participation in international testing programs is one way to provide feedback on performance and promote accountability. But such participation is neither necessary nor sufficient. An accurate, credible, and regularly updated information system is needed to improve educational outcomes and ensure that all vehicles of public accountability function on the basis of a firm foundation that provides the data needed for evidence-based policy and reform.

Improving incentives

Linking teachers’ rewards (in terms of salary or promotion) to class outcomes is controversial, but many countries are experimenting by offering incentives to teaching teams (sometimes schoolwide, sometimes specific departments) to work together to improve learning outcomes. Promotions could less controversially be tied to teachers’ efforts to upgrade their skills and competencies. Shifting more decision-making responsibilities to the school or university level would increase flexibility and incentives, provided it also promotes accountability. In parallel, in terms of incentives, additional public financing could be tied to outcomes and innovation, thus ensuring accountability for performance.

Linking higher education with employment

Although unemployment has increased worldwide as a consequence of the global financial and economic crisis, high unemployment rates of tertiary-educated graduates in MENA have been observed during the past decade as compared to those in the OECD countries. In Tunisia the unemployment rate for adults with tertiary degrees has dramatically increased in the past 10 years (figure 5.5).

This young population—hungry for knowledge, quite capable in the use of ICTs, and eager to obtain skilled jobs—poses growing demands on the higher education systems of the region. A major problem lies in the fact that the labor market in many countries remains dominated by the public sector, with the result that university graduates pass up opportunities in the private sector to wait two, three, or four years for a public sector job offering lifetime employment and better benefits than what private employers offer. Not only does this create a major distortion of the labor market, but it also deprives higher education institutions of signals about which skills are in demand and which are not. The strong preference of graduates for public sector employment is a major reason why the relationship between education and the private sector is weak. A promising effort to strengthen that relationship is the multinational Education for Employment (EFE) project (box 5.6).7

In the MENA region, about 95 percent of the economy is made up of small and medium-sized enterprises (SMEs). To make those firms more competitive, the region needs graduates steeped in innovation and entrepreneurial thinking. This means integrating innovation and entrepreneurial thinking into the education process to foster the skills, aptitudes, attitudes, and entrepreneurial mindsets that the youth of the region need to acquire to succeed and grow. A recent example of fostering entrepreneurship and self-employment in Tunisia is offered in box 5.7.

Finally, although informal employment is increasingly common, skills acquisition among workers in the informal sector does not yet play an important role in the policy agenda.8 Traditional apprenticeship based on the skills of master craftsmen is the principal channel into the labor market for dropouts from basic and early education with

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6. Such as TIMSS, PIRLS, and PISA.
7. Education for Employment (EFE)—a Washington-based nongovernmental organization (NGO) with a network of partners in business, government, civil society, and international organizations—has established independent, locally run foundations in six MENA countries that provide young people with training and job-placement services, to build their future and contribute to their communities. Local business and community leaders serve on the board of directors or advisory council of each local foundation.

8. Education for Employment (EFE) project (box 5.6).
secondary education. But these apprenticeships have significant shortcomings, including incomplete transfer of knowledge from masters to apprentices, large variations in the quality of the training provided, the perpetuation of low-productivity technologies, passive and nonexperimental learning, and a tendency for slow innovation. Masters tend to lack pedagogical skills, and apprentices are always subject to the risk of being employed as cheap labor for menial jobs. A key challenge in the region is to improve such informal training practices through public partnerships, with a view to certifying those who gain high-quality informal training. Tunisia offers an example of a government response to improve traditional apprenticeships, focusing on apprenticeship contracts, regulated remuneration levels, and incentives to employers in terms of exemptions from social security obligations.

In Egypt and Lebanon, nongovernmental organizations (NGOs) that administer training contracts play an intermediary role between master and apprentice.

Expanding regional cooperation

Euro-Mediterranean cooperation is important to support modernization processes in higher education. To improve the education system, disseminate results, and inform policy making in this crucial area in the Arab region, national efforts can be effectively supplemented by regional approaches that promote the sharing of good practices and facilitate the emergence of regional networks of experts.

Increased cooperation in the field of higher education, research, and innovation can increase competitiveness in business, help create new job possibilities, and prepare countries and regions to meet the challenges of globalization. At the university level, some MENA countries (such as Morocco, Tunisia, Algeria, Lebanon, and

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8. In poorer MENA countries and rural areas, most workers with little education work in micro-entrepreneurship and low-yield agriculture. Targeting some well-designed interventions to improve the skills of these workers could be beneficial. Programs such as India’s Barefoot College suggest training should be delivered hands-on, be community based, and combine learning with earnings. It is also most effective if provided with job search assistance and soft-skills training (Gatti and others 2011).

9. Kinship or personal relations predominate in traditional apprenticeships. Apprentices or their families bear the cost of training either by direct payments to the master or through reduced wages. This type of training can last between four and eight years, while the apprentice progresses from helper to skilled worker. There is no certification of acquired competencies.

10. In 2005, 45,000 apprenticeship contracts were signed, but only around 12,000 apprentices worked under the new rules. This illustrates the scale of the challenge in improving workers’ skills in the informal sector (World Bank and ETF 2005).
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Connecting education and employment

The high unemployment rate of young Arabs has been attributed to the mismatch between education and market needs. The multi-national Education for Employment (EFE) project focuses on the role that the private sector can play in reducing that mismatch. The project comprises a network of locally run, not-for-profit organizations that provide youth with real jobs, rather than training without the solid prospect of a job. EFE provides companies with qualified human talent based on one to three months of training. EFE projects are currently based in Egypt, Jordan, Palestine, Morocco, Yemen, and Tunisia. EFE identifies areas of the economy that offer strong potential for growth and job creation but that lack qualified personnel. Local businesses agree to hire a specified number of graduates from the program, provide funding, and offer in-kind contributions (such as office space and administrative staff). They encourage other business leaders to hire graduates and introduce EFE to government leaders and other decision makers. EFE is also implementing a new entrepreneurship program to help aspiring young entrepreneurs start their own enterprises. Since launching operations in 2006, the EFE network has trained and placed in jobs more than 2,300 disadvantaged young people from across MENA.

EFE-Egypt
• EFE-Egypt has trained and placed more than 175 young people in jobs.
• Forty-four percent of EFE graduates are female.
• From inception to the end of 2011, EFE-Egypt placed 79 percent of all graduates in jobs, with a 100 percent retention rate after three months on the job.
• Eighty-five percent of EFE-Egypt students graduate from their training programs.
• In 2012 alone EFE-Egypt is expected to train and place more than 325 young people.

Jordan Career Education Foundation (JCEF)
• JCEF has trained and placed more than 1,283 youths in jobs.
• Forty-seven percent of JCEF graduates are female.
• Ninety-four percent of JCEF students graduated from their training programs in 2011.
• From inception to the end of 2011, JCEF placed 69 percent of all graduates in jobs; of these, 64 percent had retained their jobs after three months.*

EFE-Morocco
• EFE-Maroc has trained and placed more than 420 young people in jobs.
• Fifty percent of EFE-Maroc graduates are female.
• Ninety-one percent of EFE-Maroc students graduate from their training programs.
• From inception to the end of 2011, EFE-Maroc placed 58 percent of all graduates in jobs; of these, 93 percent had retained their jobs after three months.
• In 2012 alone EFE-Maroc is expected to graduate more than 3,060 youth from employment training programs.

Palestine EFE (PEFE)
• PEFE has trained and placed more than 285 youth in jobs.
• Fifty-three percent of PEFE trainees are female.
• Ninety-three percent of PEFE students graduate from their training programs.
• From inception to the end of 2011, PEFE placed 69 percent of all graduates in jobs; with a 95 percent retention rate after three months on the job.
• In 2012 alone PEFE is expected to graduate more than 245 youth from employment-training programs.

EFE-Tunisia
• EFE-Tunisia launched operations in 2012.
• In its first year, EFE-Tunisia is expected to graduate more than 495 young people from employment-training programs.

Yemen EFE (YEFE)
• YEFE has trained and placed more than 580 young people in jobs.
• Forty-two percent of YEFE graduates are female.
• Ninety-nine percent of YEFE students graduate from their training programs.
• From inception to the end of 2011, YEFE placed 76 percent of all graduates in jobs, with a 94 percent retention rate after three months on the job.*
• In 2012 YEFE is expected to graduate more than 1,700 youth from employment-training programs.


Note: * In both Jordan and Yemen, EFE affiliates are working with very vulnerable youth populations (such as high school dropouts), which has made it more challenging to meet the network target of an 85 percent job placement rate.
Entrepreneurship training and self-employment among university graduates: Evidence from Tunisia

In Tunisia unemployment rates are especially high among recent university graduates. Yet little is known about the effectiveness of training programs aimed at increasing self-employment among highly educated youth. In this context, a new entrepreneurship track that provides business training and personalized coaching to university students was evaluated by Premand and others (2012). In this track, students in the final year of their licence appliquée program were given the opportunity to prepare a business plan instead of a conventional thesis. Of the 1,702 students who applied to the entrepreneurship track in 2009–10, half were randomly chosen to participate and the other half assigned to the standard curriculum. Comparing labor market outcomes of participants and control students one year after graduation, the study found that the entrepreneurship track increased self-employment, particularly among men. On the other hand, the employment rate among others remained unchanged. The evidence suggests that the program fostered business skills, expanded networks, and affected a range of behavioral skills. In the context of the Tunisian revolution, participation in the entrepreneurship track heightened graduates’ sense of opportunity and optimism.

Source: Premand and others 2012.

Egypt focused on adopting the licence (bachelor)-master-doctorate (LMD) degree cycles that are being standardized throughout Europe. Morocco introduced LMD reforms in 2004 to harmonize its university degrees with international systems. There has also been cross-Mediterranean consultation among Maghreb countries, much of which has been undertaken with an eye to extending the European Higher Education Area to incorporate the Maghreb into what would become the Euro-Mediterranean Higher Education and Research Area. The new system should make higher education systems of the region more compatible with the European one, thus increasing the mobility of students and faculty from the region (African Development Bank 2012).

The region needs cooperation to develop coherent qualification frameworks and quality assurance mechanisms at the higher education level. Further economic integration requires greater labor mobility rooted in international quality standards (as exemplified by the Bologna Process in the Euro-Mediterranean higher education space), networks of education and training institutions that share resources efficiently (such as EMUNI, the Euro-Mediterranean University), and the mobility of students (as demonstrated by Europe’s Erasmus Mundus program). These initiatives should be replicated within the Arab world by scaling up external cooperation and increasing resources for the Erasmus and Tempus programs geared toward the Arab world.

There are excellent opportunities within the framework of the Erasmus Mundus external cooperation window and the prospects offered by the EuroMed scholarship scheme for university students and higher education staff from partner countries. Since the launch of the Erasmus Mundus scheme in 2004, more than 3,000 grants have gone to students and researchers from MENA countries. In 2011 the European Commission announced a doubling of scholarships for southern Mediterranean countries to include a further 559, on top of the 525 scholarships already planned for 2011–12 through Erasmus Mundus (European Commission 2011). The Mediterranean Office for Youth is in its second year of interuniversity mobility partnerships modeled on Erasmus and Tempus. The Euro-Mediterranean Information Society Initiative (EUMEDIS) is another program that makes connections between European and Mediterranean research networks in the areas of education, e-commerce, health, tourism, and research applied in industry, business, and innovation.

Institutions to promote regional cooperation should be strengthened. Despite the presence of a number of Arab regional organizations in addition to the Arab Maghreb Union—such as the Arab League and the Arab League Educational, Cultural and Scientific Organization, both of whom have the objective to promote cooperation—neither national nor regional Arab organizations devote serious resources to promoting regional integration (African Development Bank 2012). The World Bank has been working to find ways to cooperate with regional institutions to launch initiatives, notably for the use of empirical evidence in the formulation, implementation, monitoring, and evaluation of policies aimed at improving education systems. The Arab Regional Agenda for Improving Education Quality is one such initiative. The Arab Network for Quality Assurance in Higher Education offers yet another opportunity for Arab countries to exchange information about quality assurance, develop quality-assurance agencies and standards for new and existing bodies, disseminate good practices, and strengthen links between such agencies in different countries.

14. The EUMEDIS program operated from 2000–06 and was extended as EUMEDRegNet in 2009 (until 2012) (http://www.enpi-info.eu/mainmed.php?id_type=10&sid=331). EUMEDIS has established a regional community of professionals, researchers, and students; about 1,000 people have been directly involved in its projects. Over 30,000 students use the EUMEDIS-produced distance-learning courses in a number of universities (IEMed 2010).
Countries in the Arab world have made significant progress in reforming education systems to expand access to all levels of education and reduce gender disparity, but the quality of education has not kept pace with the needs of the economy. The education systems of the MENA region do not adequately support the development of soft skills—analytical skills, problem-solving skills, critical thinking, and teamwork—that are critical to employability and innovation. These systems are in need of thorough reform if they are to provide more and better early child education; quality primary, secondary, and higher education programs that prepare graduates to access and use knowledge; and a system of lifelong learning that enables people to learn and produce throughout their lifetimes. The reforms will require a shift in school focus, to the fundamental and transversal skills that students need to excel in a more competitive environment.

Acknowledging that each country is unique and must chart its own path, the countries in the region would do well to press on with reform in three main areas. First, is shifting their emphasis from buildings and material inputs to improving results and solidifying partnerships with stakeholders. Second, is reorienting their management practices toward incentives to promote better performance by and responsiveness from providers of education services. Third, is moving from accountability to the state to accountability to the public so as to ensure that education reaches and enriches the greatest number of citizens, producing students with the kinds of skills needed by the productive sectors of the economy. To strengthen the connection between education and employment, educational institutions and the private sector need to cooperate much more closely. Technical and vocational education and training should assume new and wider roles in imparting the relevant, up-to-date skills necessary for the knowledge economy.

References and bibliography


Innovation renews the economic and social fabric. It boosts productivity, improves competitiveness, and raises welfare. It helps society deal with environmental issues. It is the channel through which the knowledge economy transforms society. Innovation is not just a matter of technological change and its diffusion. According to the Organisation for Economic Co-operation and Development (OECD 1996), innovation is the development and commercialization of products and processes that are new to the firm, the market, or the world. Innovative activities range from identifying problems and generating new ideas and solutions to implementing those solutions and diffusing new technologies (Gill and Raiser 2012). Central to innovation is the active engagement of people and organizations, coupled with entrepreneurship, communication, and risk taking—all within an economic climate and social system conducive to innovative ideas and initiatives.

Policies inspired by those in place in industrialized economies have begun to improve the innovation climate in Arab countries. But much remains to be done. After a brief presentation of the current situation in Arab countries, this chapter offers some suggestions to guide policy makers. An important point to make at the outset is that innovation policy should focus not only on bright innovative achievements that gain world or national renown in high-tech fields—it should adopt a broad and inclusive perspective, attending to modest achievements, even (or perhaps especially) in the poorest segments of society.\(^1\)

Efforts to innovate, and the results of those efforts, have been modest (figure 6.1). One finds a similar modesty in research and development (R&D) efforts, which account for less than 1 percent of GDP for practically all countries in the region (figure 6.2). Moreover, governments fund the bulk of R&D, with limited engagement from the private sector (figure 6.3). There are, however, slightly positive trends in non-oil-exporting countries (notably Tunisia). The exception among oil exporters is Qatar, where R&D expenditures reached 2.8 percent of GDP in 2009.

High-tech exports are low, but increasing. Because oil-related exports dominate their trade structure, the Arab countries exhibit a low share of high-technology exports among total exports, as compared with the rest of the world (figure 6.4), and therefore exhibit low competitiveness in global manufacturing production. But the share of high-technology exports has grown over the years, as has the share of medium-technology exports—trends that point to a gradual improvement in the region’s industrial competitiveness. The progress made by those countries that are more engaged in high-tech manufacturing and exports, notably Lebanon and Tunisia, is clearly apparent in figure 6.4c.

Some advances in innovation effort and performance have therefore been made. In addition, a few countries, such as Jordan, exhibit a higher degree of efficiency in innovation than one might expect given their science and technology endowments (see chapter 2, and for more details see Diop and Ghali [2012]). These encouraging signs should be amplified by efficient policies.

1. This chapter uses background contributions by Radwan, Strauss, and Bell (2011); Kuznetsov, Dahlman, and Djeflat (2012); and Djeflat (2012).
2. The three indicators used in the KAM for measuring innovation performance are (i) royalty receipts and payments in U.S. dollars, (ii) the ratio of patents granted by the U.S. Patent and Trademark Office to the population, and (iii) the ratio of articles published in scientific and technical journals to the population (World Bank 2012). These indicators measure inputs or intermediary products rather than innovation outcomes, but they are the only standardized data available worldwide that approximate innovation capabilities.
Figure 6.1
Innovation performance and GDP per capita: Select Arab countries compared with the world

Source: World Bank 2012; World Development Indicators.
Note: UAE = United Arab Emirates; GDP = gross domestic product.

Figure 6.2
Gross national R&D expenditures as a percentage of GDP in select countries, 2000–09

Source: UNESCO Institute of Statistics.
Note: GDP = gross domestic product.
when the results of these investments proved disappointing, and inspired by then-fashionable global trends, they began to devote sizable resources to the building of innovation sites in the form of incubators and technoparks—a trend that has developed over the past decade and has largely concerned information technology businesses, which account for about half of the firms and jobs created in those sites. More recently, policy makers have expanded and honed their instruments of intervention, drawing on international evidence. The need to broaden the concept of innovation, and its policy arms, should be strongly reaffirmed. To appreciate an efficient innovation policy, it is useful to examine the characteristics of the so-called “gazelles”—innovative firms with high-growth potential—and the actions needed to support their development (box 6.1).

Innovation policy must be cross-departmental. By its very nature, innovation touches many policy areas—among them research, industry, education, trade, finance, and competition (figure 6.5). Countries that have grasped this essential truth have established coordinating bodies for innovation policy, positioning them at the prime ministerial level, with the capacity to make decisions and the authority to implement them. In the early 1990s Finland set up its Science and Technology Policy Council (transformed in the mid-2000s into an Innovation Policy Council) that brought together concerned ministers, including the minister of finance, along with high representatives from business, the trade unions, and civil society, under the chairmanship of the prime minister. Such bodies have been decisive in putting innovation policy at the forefront of national development strategies.

Promoting innovation is like gardening. While being cross-departmental and cross-sectoral, innovation policy must also focus clearly on the promotion of innovation. From this perspective, the tasks to be performed include supporting innovators,

### Figure 6.3
Gross national R&D expenditures in select countries, by source of funds

![Gross national R&D expenditures in select countries, by source of funds](chart)

Source: UNESCO Institute of Statistics.

Note: R&D = research and development.

### Figure 6.4A
Total exports by technology category, world excluding MENA, 2005–09

![Total exports by technology category, world excluding MENA, 2005–09](chart)

Source: UNIDO 2011.

### Figure 6.4B
Total exports by technology category, MENA, 2005–09

![Total exports by technology category, MENA, 2005–09](chart)

Source: UNIDO 2011.

### Figure 6.4C
Share of high-tech exports among total manufacturing exports of selected Arab countries, 2005–10

![Share of high-tech exports among total manufacturing exports of selected Arab countries, 2005–10](chart)

Source: Authors’ compilation based on Comtrade database 2010.
removing all sorts of weeds that keep innovation from spreading (anticompetitive behaviors, bad regulations, and so on), nourishing the knowledge base by improving R&D structures or tapping global sources, and educating the population at different levels to stimulate its interest in innovation (figure 6.6).

What it takes to promote innovative firms

A recent study (Stone and Badawy 2011) observes the characteristics of fast-growing small and medium-sized enterprises (SMEs) included in the World Bank’s Investment Climate Assessment Surveys in the MENA region. The characteristics associated with high growth among SMEs include being an innovator, offering workers formal training, and receiving an international quality certification. In Egypt, a panel data set allows observation of true “gazelles”—SMEs that grew an average of 20 percent or more over more than four years. Their analysis links gazelle status among manufacturers to training employees, using e-mail or having a company Web site, being less than 10 years old, getting a high number of inspections, experiencing fewer power interruptions, and using foreign-licensed technology (considered here a type of innovative behavior). The cross-country analysis highlights the link between high SME growth and innovation, workers’ education, formal training, firms’ quality certification, and e-mail use. It links innovation to these factors, and to competitive pressure, whether local or international. Attention is then directed to human resource policy on education and training, the policy framework and incentives for firms to train workers, national quality-assurance systems, and telecommunication policies that support e-mail and Internet use. The paper concludes with the exhortation to “educate, train, certify, link, compete!”

Source: Stone and Badawy 2011.

The sources and carriers of innovation extend well beyond science and technology. Innovators come in three basic forms: PhD-level innovators and originators in science and technology, creative recombiners of existing knowledge (academic degrees being more or less relevant), and reinventors (with MBAs) who innovate through new business models and processes (appendix 6.1). The last two categories should not be neglected, particularly in low- and medium-income countries, which do not have strong R&D structures and import the bulk of their technology. Each type of innovator needs different types of support.

Bridge institutions that connect the different actors involved in successful innovation processes and systems are an essential tool of innovation policies. They include, among other things, incubating structures, technoparks, dynamic universities, venture capital bodies, and diaspora networks (Kuznetsov, Dahlman, and Djeflat 2012). Such tools should receive special attention, along with incentives and programs that facilitate collaboration between concerned actors. Inspired by these principles, Morocco’s recently established innovation policy includes a program to support the development of clusters, a program to support start-ups (including the provision of expertise through networks), and a program to support the financing of R&D projects conducted in collaboration between the business sector and public or university laboratories.

The following sections focus on a series of key functions, inspired by the gardening analogy: supporting innovators, bringing R&D structures into the service of the economy and society, tapping into global knowledge and technology, and educating innovators. The building of innovation sites is discussed in chapter 9. Removing obstacles to innovation is treated as a cross-cutting issue.3 The chapter concludes with remarks on “soft” measures for stimulating change, which should be implemented with the support of international cooperation programs.

3. These points are echoed in a forthcoming interim report from the CMI program on Knowledge Economy, Innovation, and Technology, which is led by the European Investment Bank (EIB) (http://cmimarseille.org/Knowledge-Economy-Innovation-Technology.php).
A variety of policy measures is needed to provide complementary types of support. Three are particularly important: measures for project incubation, for financing, and for legal issues (intellectual property).

Incubators host would-be innovators and business creators in structures that provide common services—from basic services such as photocopying machines to more sophisticated ones such as connecting with trade channels or venture capital funds. There are some 500 incubators operating today in the Arab world, a number of them installed in technoparks or in universities. Many of them have been established by government authorities, or with their active support, either by national ministries or by municipalities. A recent assessment (ANIMA 2012) reports the mixed performance of such structures, pointing out a lack of professionalism, an excess of informal connections and lack of solid evaluations in selecting projects, and weak links with supportive groups such as business angels. The best incubators seem to be those that actively involve the business and private sector in their management and governance, with motivated local actors from government, academic, and other circles.

There is a serious lack of development of venture capital in the Arab countries, particularly in the middle-income, resource-poor countries (figure 6.7). The financial markets are dominated by a conservative banking sector, and investors’ rights are poorly protected. The venture capital market is limited, compared with the situation in developed economies.

It will take time to develop a vibrant financial environment in which venture capitalists and business angels can operate securely. Meanwhile, measures can be taken and institutions established to support innovation. An example from Lebanon is given in box 6.2.

The development of innovative forms of financing is already competing with traditional financing models in economically advanced and emerging economies (Rocha and others 2010). Chief among those is crowdfunding, which is based on the idea that the decision of a large group may be sounder than that of an individual. It marries that idea with the power of the Internet to bring groups together to pool their resources and identify investment opportunities. Small businesses with exciting ideas and no other way of tapping venture capital can now attract financing by pooling large numbers of small pledges. Now that social media, online communities, and micropayment technology make it easy to solicit and accept donations from a group of potentially interested supporters at very low cost, the idea is developing rapidly. Crowdfunding has been used for a variety of purposes, from raising money for charity to financing music tours and producing movies. Entrepreneurs can use crowdfunding to solicit small amounts of money from individuals who are typically not professional financiers. Inspired by this approach, a team from Cairo University has recently launched an initiative to support inventors and entrepreneurs from the city’s slums, providing them with technical support and other sources of expertise (box 6.3).

4. The first initiatives appeared in Maghreb countries. There are currently 30 incubators operating in Tunisia and a dozen in Morocco. In Morocco, the average number of incubees is 10 per structure (for 16 proposed projects).
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Small innovators need efficient systems of intellectual property protection to support and shield their ideas and inventions. In most cases, the protection afforded by the system of utility models, which is less expensive than standard patent procedures, can provide the necessary protection. When seeking stronger protection, notably for patenting abroad—in particular in the triadic system (United States, Europe, Japan)—innovators and inventors require financial and technical support. It is vital that Arab countries equip themselves with appropriate patent agencies. This is an area where inter-Arab cooperation and a regional approach would be particularly beneficial. In a similar vein, to stimulate technology transfer and upgrading, efficient mechanisms should be established to facilitate the licensing of technology from foreign firms, including the negotiation of related contracts.

**Kafalat, a Lebanese institution providing venture finance**

Kafalat, a Lebanese company that was created in 1999, provides loan guarantees to small and medium-sized enterprises (SMEs) based on business plans and feasibility studies that show the viability of the proposed business activity. It targets innovative start-ups and SMEs in industry, agriculture, tourism, traditional crafts, and high technology. Kafalat-guaranteed loans benefit from interest rate subsidies financed by the Lebanese Treasury and administered by the Central Bank of Lebanon. Kafalat aids borrowers by using its feasibility studies to induce lenders to require lower collateral. Kafalat also serves the lender’s interest by lowering loan risks. Kafalat-guaranteed loans in Lebanese pounds are exempt from the statutory reserve requirement of the Central Bank of Lebanon. This reduces the costs of the lending bank, allowing it to lend to customers with lower interest rates. Kafalat’s credit guarantee system encourages business formation and increased domestic investment, output, and employment. Currently the maximum loan amount for a Kafalat Innovative guarantee is 300 million Lebanese pounds (approximately $200,000).

**Yomken (”It’s possible!”)**

Yomken.com is the first open-innovation and crowdfunding platform in the Arab world that tries to bridge the gap between (i) the challenges faced by micro- and small entrepreneurs (MSEs) working mainly in low-tech and informal manufacturing industries (designing new products and upgrading current products and production processes) and (ii) the innovative ideas and skills of potential problem solvers (graduation projects, innovative solutions from recently graduated engineers, designers, researchers who are looking for a job, the Arab diaspora); and then, once the gap is bridged, using crowdfunding to finance the products that emerge from the matchmaking process. Yomken offers MSEs and nongovernmental organizations (NGOs) working across the Arab world a space to post challenges that they encounter. Potential solutions are posted by problem solvers, capitalizing on the “wisdom of the crowd.” A group of volunteer experts review the proposed solutions to choose the best one for implementation.

To tap the potential for innovation, Yomken’s team began in its pilot phase by supporting more than 60 workshops in Manshiet Nasser, Cairo’s mega slum of some 800,000 residents. The range of the workshops’ products included toys, souvenirs, plastic gadgets, and handmade furniture.

In crowdfunding, buyers prepay for products from their e-wallets, and if the targeted amount (including the production costs and profit) is pledged, both the workshop owner and the innovator together initiate production. Funders can track the use of their contribution during the production process all the way through the social impact the project has after production is completed (for example, creating more jobs, increasing the income of the workshop owner, and so on).

The initiative has received seed funding from the World Bank’s Youth Innovation Fund and is being implemented in partnership with the Istebda’ Initiative.

**Box 6.3**

**Putting R&D structures in service of the economy and society**

*The level of scientific production in the Arab world is relatively low but growing in some countries* (figure 6.8). Publication of scientific and technical journal articles by authors residing in Arab countries has increased in volume over the past decade (figure 6.8). But the level is still low compared with economically advanced economies (Japan accounted for 49,627 articles in 2009, Germany 45,003), and with certain rapidly developing countries, such as China (74,019 articles...)

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5. Few residents of Arab countries file patent applications in their national patent system. In 2010 Egyptians filed only 605 applications, Saudi Arabia 288, Morocco 152, Algeria 76, Jordan 45, and Yemen 20. Compare these figures with Japan (290,081 applications) and Finland (1,731 applications) in the same year.


in 2009, with an increase of more than 10,000 from two years before. Arab countries produce fewer books and fewer scientific and technical articles than other world regions. Egypt had the highest level of publication in both 2002 (1,564) and 2009 (2,247), with an increase of more than a third over the period. Egypt is followed by Tunisia (from 354 to 1,022) and Saudi Arabia (from 582 to 710).

The scientific potential of Arab countries is not negligible (figure 6.9). The proportion of science graduates among total tertiary graduates in the Arab countries does not deviate greatly from the same proportion in high-income countries, though rates of enrollment in tertiary education are much lower (25 percent versus 50 percent or more). But when it comes to the number of researchers in R&D per million inhabitants, the gap widens, with the high-income countries having roughly six times the number of R&D researchers per million inhabitants as the Arab countries. Moreover, the level of R&D resources per capita is low, even when compared with countries at a similar level of development. This is a factor in the low scientific output of the Arab countries. More resources for the R&D system would certainly be useful. Meanwhile it is important to find ways and means to put the existing R&D capabilities to better use in service of the economy and society.

One way of ensuring that R&D structures are more responsive to economic and social needs would be to require them to obtain a significant share of their budgets (30 percent or more) from contracts with outside sources—business, public agencies, or foreign partners with which they cooperate through bilateral or other arrangements. This rule, which is now systematically applied in developed economies, can be effective as long as the R&D structures have enough talent and receive enough resources from the national budget to ensure decent salaries and equipment for researchers. Targeted programs can also provide useful support to selected teams and well-defined scientific and technical areas for collaborative R&D projects developed with the business sector. Egypt put in place an exemplary program with support from the European Commission (box 6.4).

In addition to putting in place financial incentives and subsidies to stimulate collaboration, governments can support the interactions between research and industry through many different types of mechanisms that have proven their utility and efficiency in countries at various levels of development (World Bank 2010). There is ample room for improvement in Arab countries. For instance, in Egypt, a recent field study (Duballe 2012) highlighted the need for technology transfer offices focused on indigenous capabilities (to complement existing offices focused on technologies brought in by foreign firms); the absence of incentives (financial and otherwise) for faculty and researchers in universities to collaborate with the business sector; and the absence of business-oriented modules for students in science and engineering programs.

Obstacles to collaboration with business need to be removed. To complement measures designed to improve the interface between research institutions and industry, it will be important to remove administrative and regulatory obstacles that prevent or limit collaboration. A recent study on Morocco (Djeflat 2012) noted the Ministry of Finance’s requirement that research and training contracts between universities and external clients—notably business enterprises—receive prior review as a bureaucratic hurdle with very negative consequences.

Technology services for metrology, standards, and the like need to be fully available and functioning. A last point of fundamental importance is to organize and improve as necessary the infrastructure of technology services that operate in Arab countries.
countries to ensure that these often large bodies truly serve the needs of the economy and society. The improvements should begin with the establishment of powerful, modern facilities for metrology, standards, testing, and quality control (MSTQ), where appropriate at the regional level to achieve economies of scale, concentrate expertise, and ensure greater standardization. Structures at the national level and subnational levels should be properly equipped, administered, and financed, while being systematically opened to inventors, innovators, and enterprises in need of technical measurement, testing, or assays.

Many countries have demonstrated the importance of drawing on global knowledge, including India and China, whose technological take-offs depended on the good use of imported know-how. Three points will be discussed in this section: research cooperation, linkages built on foreign direct investment (FDI), and the mobilization of diasporas.

Participation in global and regional research networks is of crucial importance. The Gulf countries, which have made huge investments in new universities, have rightly put international cooperation at the core of their operations. Initiatives taken with the support of the European Commission to benefit the southern Mediterranean countries have raised the research capabilities of several dozen organizations by pairing them with northern institutions, mounting technical assistance programs, and offering internships in foreign laboratories. Bilateral cooperation programs have also been important. The benefits and impact of such cooperation mechanisms can be maximized by drawing lessons from past experiences and applying good practices. The lessons drawn from German bilateral cooperation are presented in box 6.5.

FDI is an essential source of technology transfer. Improvement of the overall business environment is key to attracting FDI, as discussed above, but campaigns to inform and attract potential investors are also useful. Such measures include: providing training and building capacity in investment generation (targeted to development agencies, chambers of commerce and industry, and business organizations); following up and promoting FDI

**Box 6.4**

**Promoting collaborative R&D projects between university and industry in Egypt**

The Innovation Fund, established with resources from the European Union (EU), was the principal component of Egypt’s Research, Development, and Innovation Program, which supports innovation and entrepreneurship. While it was active, the Innovation Fund supported cross-cutting projects related to industrial challenges and national priorities. Projects were initiated and run in collaboration between research bodies and industry. Grants were awarded on a competitive basis to collaborative consortia from universities, research institutes, and industry.

From a large number of high-quality applications that indicated clear demand from the research and business communities, the Innovation Fund was able to select 51 projects for funding before encountering budget limitations. Almost 43 percent of the fund’s 134 beneficiaries were from industry, which contributed about €1.6 million (as cofinance) to Egypt’s R&D expenditures, reflecting clear interest in R&D based on applied research and market demand. Because of the fund’s support for international collaboration, more than 26 European and Mediterranean partners participated in the development of funded projects that led to exchange of knowledge and know-how with Egyptian counterparts. Seven collaborations have developed new products/services that are expected to generate a return on investment of approximately €40.4 million by 2014.

The Innovation Fund’s “Scheme 2” provides funding for projects that address specific industrial challenges not requiring mega finance, in addition to funding measures to create and support the innovation culture in Egypt.

Source: http://www.rdi.eg.net.

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8. One of the foundations of the Japanese technological take-off in the 19th century was the opening of some 80 prefectural laboratories that provided technical assistance to SMEs, as well as facilities in which to build prototypes and test technologies.
and partnerships in the region (with monitoring, regular reports, newsletters); advocating for and following up on reforms to restore trust and increase the attractiveness of countries and regions (for example, through the World Bank Doing Business exercise); and promoting safer transactions through guarantee schemes, arbitrations, and measures to protect intellectual property.

FDI takes many forms, including business acquisition, creation of representative offices, so-called greenfield investments, joint ventures, cooperation agreements, franchise shops, joint R&D centers, and technological partnerships. The last few are the most productive from a technology transfer viewpoint. As noted in chapter 3, joint R&D centers are efficient investments in jobs, as measured by dollars per job created. FDI in manufacturing should be accompanied by linkage programs that will help raise the technological and management level of local businesses that supply parts and components (and enhance the efficiency of clients in downstream value chains) by improving standards and certification and delivering after-sales services, for example. Linkage programs that formalize mechanisms for technology transfer and management improvement should follow international best practices. Renault’s new manufacturing plant in Morocco is an excellent example, which includes agreements for the provision of training, technical assistance, and certification and contracts with local firms, themselves operating in joint venture with foreign suppliers, for components and materials.

### Good practices for international cooperation in research

The following lessons have been gleaned from years of German collaboration with southern Mediterranean partners:

- Insist on funding from both northern and southern partners, even if the funding provided by the latter is small.
- Insist on the inclusion of young scientists as a criterion for selecting and supporting projects.
- Listen to alumni (notably doctoral candidates) when they return from stays in Europe. Provide start-up grants to help them launch their activities in their home country.
- Make use of bilateral support, as a kind of seed money, to prepare applications and obtain funding from larger EU projects.
- Train universities, research teams, projects, and programs in management and good governance.

Source: Hülschörster 2012.

Diasporas, particularly those consisting of highly educated and talented people, are precious assets. They have played key roles in helping raise the technological level of large countries such as China and India as well as of smaller countries, such as Ireland, which has systematically tried to attract educated migrants from Europe and North America. There are more or less formal diaspora networks in several Arab countries, notably in the Maghreb, thanks to long-lasting links with the French grandes écoles. Some are fairly active and have already contributed considerably to the economic and technological development of their countries of origin, notably in Morocco and Tunisia. They help elite institutions to develop (box 6.7), while also exerting more diffuse effects, which nevertheless can be of great importance.

Arab countries would do well to organize mechanisms through which their diasporas can contribute to the development of their homeland. International experience (described in Kuznetsov [2006]) demonstrates that it is important to combine a bottom-up approach in which committed groups and individuals become involved in more or less formal networks with central arrangements through the Ministry of Foreign Affairs that help support those networks. Then, to facilitate investments by diaspora members in specific projects, whether they return to their country of origin or operate at a distance, sector ministries or regional offices should be prepared to help match the assistance proffered by diaspora members with local demands. The combination of a bottom-up approach with a focus on specific projects is possible through dedicated networks, as illustrated by proven initiatives in Scotland and Chile. Table 6.1 summarizes the approaches.

### Educating for innovation

Improving competencies and skills to support a knowledge-economy-based development process was discussed in chapter 5. This section considers the more specific issues of cultivating a mindset of innovation and entrepreneurship among young people. It begins with higher education, discusses training for unemployed youth, and ends with primary and secondary school students.

Growing numbers of postsecondary programs in engineering and management train students in innovation and entrepreneurship, often through twinning with prestigious institutions abroad. Twinning not only delivers top-notch experiences, but also helps to attract and retain the country’s brightest students. Particularly promising from the point of view of the knowledge economy are research universities that embrace
innovative approaches. A good example is Morocco’s International University of Rabat, a private establishment launched a few years ago that has attracted businesses, including Moroccan subsidiaries of foreign companies, to the technopark surrounding the school (box 6.6). The emergence of dynamic private universities has stimulated change in higher education systems by stimulating competition and emulation. In Morocco top engineering schools such as Mohammedia have significantly adapted their programs to respond to new demands and challenges. Bureaucratic hurdles of various types have hampered the transformations that such schools could have stimulated. For instance, decrees establishing equivalences between the diplomas offered by private and public universities have been delayed, to the detriment of private institutions.

**Complementing the support offered to would-be entrepreneurs through incubators and related means, agencies have devised training schemes to assist unemployed individuals wishing to start their own business.** These schemes, inspired by an active employment policy and often implemented in connection with chambers of commerce and industry, require sustained coaching and combined technical and financial support. Morocco’s ANAPEC (Moukawalati) program is among the most developed of such schemes. There is also a population of potential entrepreneurs among the ranks of marginalized youth, whose creative potential can flourish in well-adapted schools. A good example is provided by the Second Chance Schools, a model pioneered in the French city of Marseille about a decade ago, which has been emulated throughout France to improve the prospects of marginalized young people living in poor suburbs and slums.12 The aim is to raise the competencies of students to basic levels in writing, reading, and arithmetic in a year of intensive courses. At the same time, students are placed in businesses, where they work half time. The businesses commit to employ the student for 18 months after the

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**TABLE 6.1 Diaspora strategy: Combining top-down and bottom-up approaches**

<table>
<thead>
<tr>
<th>Centralized approach</th>
<th>Central focal point</th>
<th>Incorporation into everyday practice</th>
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<td>Diaspora ministry</td>
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<table>
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<tr>
<th>Bottom-up (decentralized) approach</th>
<th>Diverse entry points</th>
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<tr>
<td></td>
<td>Diaspora NGOs, research groups</td>
<td>Managed networks (as GlobalScot and ChileGlobal)</td>
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</table>

Source: Kuznetsov and Morgandi 2009.

Note: FDI = foreign direct investment; NGO = nongovernmental organization.

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**BOX 6.6 The International University of Rabat**

The International University of Rabat is the first private university in Morocco, established in 2006 by a member of the Moroccan diaspora, a former professor at the Polytechnic University of Nantes. The university is an internationally oriented, R&D-driven university housed in the Technopolis of Rabat, an industrial area that aspires to host high-tech industries.

The university began offering its undergraduate and graduate courses in English and French in 2012, charging annual tuition of about $10,000, high for Morocco but internationally competitive. The target audience is elite students from the African continent who would normally study in Europe. The university’s public-private partnership (PPP) with the government of Morocco has allowed it to use academic personnel from the public sector and to gain official recognition of its degrees and diplomas. In addition, the university enjoys the patronage of a powerful segment of the local economy: it is built on land donated by the king and has representatives of leading local financial institutions and companies on its board and among its donors.

The crucial element of the institution’s success is its autonomous status. Autonomy allows the institution to bypass the civil service code and define its own policies for recruiting and managing talent, above all diaspora members. Forty percent of positions are reserved for faculty working in partner universities that allow students to spend semesters in Europe or in the United States. The university is able to pay internationally competitive salaries for a few department heads who act as magnets for talented younger researchers. Staff are expected to connect with clients in the local private sector and are rewarded for their results (such as patents, research grants, and contracts with the private sector).

The R&D strategy is tailored to generating “inexpensive innovations” for the domestic and African economy: (i) infrastructure development for transportation, tourism, and affordable housing; (ii) renewable energy using local sources; and (iii) local niches (such as railway, naval, automobile, and aerospace engineering). Recent successes include an R&D contract with a local micro-camera export company, the creation of a start-up producing patented solar and wind-fueled devices, and technical assistance to the state-owned foreign currency exchange office.

Source: Djeflat 2012.

12. Currently there are 186 Second Chance Schools in France, enrolling a total of 12,000 young people.
Chapter 6: Fostering innovation and technological upgrading


Inculcation of a culture of innovation and entrepreneurship begins in secondary school, or even at the primary level. Enterprise creation and management can be taught in secondary schools through simple kits that use games to present the necessary concepts and methods. There are also well-tested and proven programs to familiarize students with the culture of science, such as the French initiative entitled La Main à la Pâte (www.lamap.fr), designed by 1992 Nobel prize winner Georges Charpak, which has been successfully applied in Latin America and Africa.

Stimulating change through international reviews and joint projects

Innovation policy requires precise incentives, regulatory actions, and often consequential investments in research laboratories, educational institutions, or logistics and other infrastructure. But it often begins with, or derives momentum from, subtler actions aimed at changing mindsets, perceptions, and behaviors. Among the measures that have proven to be efficient, based on global experience, are the following:

- **National policy reviews** by international bodies such as the OECD or the United Nations Industrial Development Organization (UNIDO), which have formalized methodologies to gather information, conduct field studies and evaluations, and discuss outcomes with government authorities and concerned stakeholders. The innovation systems of several Arab countries have been the subject of in-depth analysis, as for example, the work on Abu Dhabi by Andersson and others (2010) and on Morocco by Andersson Djeflat and Johansson de Silva (2006).

- **Foresight exercises** in which information is collected on future technological trends or industrial developments of particular interest for the concerned countries, notably through groups of selected national and international experts. Such exercises are useful to shape future strategic choices.

- **Audits of industrial sectors** or activities, in which competencies, gaps, and needs are identified and plans drawn up, notably for the purpose of supporting niches with high growth and employment potential (see chapter 8).

- **Public campaigns** using media, including social media, to build awareness in society at large by spotlighting promising achievements and success stories.

- **Demonstration projects** with high growth and job potential, such as those supported by the World Bank through rapidly delivered schemes (box 6.7).

The measures currently undertaken in Jordan to stimulate innovation combine those different instruments (see annex 3).

**Within a regional perspective, a broad program of innovation support has been proposed** by the Marseille Center for Mediterranean Integration (CMI), European Investment Bank (EIB), and its partners [ANIMA 2012] that includes:

- The mobilization of innovation actors through an online platform and sector task forces
- Mutual information tools such as technology monitoring and project promotion actions
- Coordination of national services for project support, seed funding, living labs, and so on
- Governance-related initiatives (for example, to improve the management of technoparks and incubators through a more entrepreneurial approach, and better coordination between policies to attract foreign investors, industrial policies, and innovation policies)

In the field of R&D policy, the European Commission has recently launched a call for proposals for regionwide initiatives involving the codesign, coownership, and mutualization of efforts and benefits in several priority areas, including renewable energy, water management, the environment, and transport (among others).13 With a budget of €40 million, the program should be an important step toward a strong Euro-Mediterranean research and innovation space.

**Box 6.7**

**iMENA: An innovation agenda for jobs and financing of innovation in the Arab world**

Some of the most important avenues for job creation are start-ups and small businesses (including micro-enterprises). But these enterprises often have trouble securing funding from traditional sources. The World Bank has thus been working on creating and supporting innovative funding opportunities for these so-called gazelles [high-growth companies]. Examples of this work include matching grant schemes in Tunisia, building networks and links with diasporas through initiatives like Oasis500 in Jordan, and South–South learning exchanges based on similar innovative development agendas. These activities are feeding into a regional MENA Innovation Strategy [iMENA] that will become a living document that collects the knowledge and understanding gained from the various activities.

*Source: Authors.*

Conclusion

Innovation efforts and performance in the Arab world are low but increasing. Government policies and program are being deployed to create and exploit innovative opportunities. Public authorities are involved in an ongoing learning process. Further support from the international community would be useful to foster the innovation climate.

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Appendix 6.1 The different types of innovation and related ecology

Which innovation outputs?
- New products
  - S&T-based origination-type innovators (PhDs mostly)
  - A growing community of first-rate scientists and engineers
  - A critical mass of respected university research centers
  - Absence of barriers impeding scientist entry or return
  - A minimum basic research base within the country
  - A balance of basic, applied, and commercialization R&D
  - Strong incentives for private sector involvement in R&D
  - Proper emphasis on payoff through commercialization

- New services
  - Creative recombination-type innovators (degree +/- irrelevant)
  - High caliber, variety, and size of the creative class
  - Respect and autonomy bestowed on creative types by society
  - An exceptionally favorable environment for startups
  - An absence of impediments to professional service exports
  - A critical mass of sophisticated service industries, esp. IT
  - A critical mass of design and other creative industries
  - Plenty of sophisticated users for innovators to engage with

- New business models or ways of doing things
  - Business model/process reinvention-type innovators (MBAs)
  - Quality, variety, depth of country’s enterprise universe
  - Quality and number of bold, innovative firms within it
  - Number in rapidly changing, complex fields
  - Number with flexible organizational approaches
  - Exposure to strong worldwide competitive winds
  - Openness to business model reinvention, few legacy hangups
  - Proneness to use of IT as trigger and vehicle for this openness

Which types of innovators and innovation?
- Good research environment, salary, and social standing as a magnet for elite science types from home and the diaspora
- Outstanding living conditions and a lively creative industries ecology as a magnet for creative types from the world over
- Enticing FDI conditions as a magnet for frontier enterprises and game-changing entrepreneurs from all over the world

What kind of an environment will they thrive in?
- Innovative attractions and innovation support policies
  - Upgrade a few basic and applied research centers to world class.
  - Attractive “in” cities, UA. Catalytic creative industries programs.
  - Special zones, tax and other steps to attract innovative TNCs.

- Innovation personnel development policies
  - Vigorous tertiary education and LLL reforms to rapidly enhance the supply of first-rate S&T, design/creative, MBA, and other graduates.
  - Upgrade quality and respect for mid-level technicians degrees.
  - Early childhood, basic, secondary and vocational curriculum changes with a strong pitch towards creativity, design, teamwork, problem-solving, IT, foreign language and other platform skills.

- Dynamic entrepreneur- ship policies
  - Systematic entrepreneurship training in secondary and tertiary education.
  - Top-rated business environment.
  - Superb business development support services.
  - Reinforced IPR and MSTQ regime.

- Networking and knowledge access policies
  - Smart support and good legal setup for academia/research/industry links.
  - Strong support for global knowledge access and networking [e.g., science attaches; fairs; diaspora networks, study tours]. English for all program.
  - World-class, highly competitive ICT services, with high broadband coverage.
  - IT-related SME support programs.

- Innovation demand-side policies
  - Ambitious IT diffusion and IT literacy programs.
  - Advanced e-government as catalyst.

  - Innovation-promoting public procurement policies.
  - Turning selected government services into innovation powerhouses, and outsourcing others. Standards & norms that promote innovation.

What are the key success factors in an innovation economy?
- AGILITY: Top-rated and innovation-friendly business environment. High level of competition within business and finance sectors.
- CONSTANT LEARNING: Systematic scanning of global knowledge, technologies, patents, ideas, market data. Intense exchanges with outside peers, gurus, pioneers firms, top innovators.
Chapter 7
Moving toward an information society

In today’s knowledge-based world, countries are developing dynamic information societies. These societies are founded on advanced information infrastructure, as measured by the spread of mobile telephony, computers, Internet access, and new e-applications, all supported by a fast-changing information technology (IT) industry that has become a major source of employment and an important contributor to growth.

There is ample evidence that information and communication technology (ICT) plays an increasingly important role in economic growth. The World Bank reported in 2009 that in low- and middle-income countries, every 10 percentage-point increase in broadband penetration accelerates economic growth by 1.38 percentage points. The study further found that the development impact of broadband is greater in emerging economies than in high-income countries, which “enjoyed a 1.21 percentage-point increase in per capita GDP [gross domestic product] growth” for each 10 percent increase in broadband penetration (World Bank 2009b). The study also demonstrates that broadband has a potentially larger growth effect than other ICTs, including wireline telephony, mobile telephony, and the Internet, as shown in figure 7.1 (Kelly and Rossotto 2012).

Events of the recent past have highlighted the power of ICTs to effect change in the Arab world. In the aftermath of these events, there is a great opportunity to extend reforms of the ICT sector, increase competition, broaden access to mobile telephony, improve broadband access, remove restrictions on Internet access and use, and provide new opportunities to increase employment, foster entrepreneurship, and enable better transparency and governance. Efforts should also be made to develop ICT applications to facilitate improvements in the delivery of vital economic, social, and government services to citizens. In addition, special attention must be paid to upgrading workers’ skills and competencies to enable them to use new applications and technologies. This chapter provides a brief overview of the state of the information infrastructure in the region and highlights some areas that still need strengthening in the Arab world.

![FIGURE 7.1](image)

**Effect of various ICTs on GDP growth in high- and low-income economies, 2000–06**

<table>
<thead>
<tr>
<th>Services</th>
<th>High-income economies</th>
<th>Low-income economies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed telephony</td>
<td>1.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Mobile telephony</td>
<td>1.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Internet</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Broadband</td>
<td>1.5</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Source: Adapted from Qiang and Rossotto 2009: 45.

Note: Measures the percentage point increase in GDP that is associated with a 10 percent increase in different ICTs. ICTs = information and communication technologies; GDP = gross domestic product.

1. This chapter draws on many published works, among them Rossotto and others (2011) and Kelly and Rossotto (2012), and on background studies by Radwan and Straus (2012), Koivisto and Larsen (2012), and Häkönen (2012).
2. The term “broadband” may refer to several aspects of telecommunication networks and services, including (i) the infrastructure or “pipes” used to deliver services to users, (ii) high-speed access to the Internet, and (iii) the services and applications available via broadband networks, such as Internet Protocol television and voice services that may be bundled in a “triple-play” package with broadband Internet access. Further, many countries have established definitions of broadband based on speed, typically in megabits per second or kilobits per second, or on the types of services and applications that can be used over a broadband network (that is, functionality). Reflecting each country’s unique needs and history, including economic, geographic, and regulatory factors, definitions of broadband vary widely (Kelly and Rossotto 2012).
3. An example of the power of social media can be seen in their role in the 2011 Arab Spring uprisings. Protest organizers used Web sites such as Facebook, Twitter, and YouTube, in addition to texting and other narrowband technologies, to coordinate protest activities. Social media facilitated the spread of information about citizens’ actions, through YouTube videos and conversations on social Web sites. These online tools enabled the organizers to spread awareness and increase participation and attendance at demonstrations faster than more traditional media could allow (Kelly and Rossotto 2012).
4. A recent report looks at the impact of mobile telephony (substituting 2G connections with more advanced 3G connections) on economic growth (Deloitte, GSMA, and Cisco, 2012). It highlights that:
   - A doubling of mobile data usage increases the per capita gross domestic product (GDP) growth rate by 0.5 percent (based on data for 14 countries).
   - Substituting 10 percent of 2G connections with 3G connections boosts GDP by 0.15 percentage points (based on penetration data for 96 developed and developing markets).
   - A 10 percent increase in mobile penetration boosts total factor productivity by 4.2 percent.
Arab countries have made great strides in ICT diffusion since the mid-1990s, thanks to a host of liberalization reforms and the global development of ICT technologies, which have driven down costs and made access easier. Fixed telephone lines connected only about 10 percent of the population of the Arab world in 2010. As in many developing countries, it is the mobile cellular segment that has grown—from almost nothing in 2000 to 87 subscriptions per 100 people in 2010 (figure 7.2). For example, the United Arab Emirates (UAE) has one of the highest rates of smartphone penetration: 61 percent (The Economist 2012).

**Progress has also been made in Internet penetration.** Between 2000 and 2010, the number of Internet users in the Middle East and North Africa (MENA) grew tenfold to more than 100 million, with wide variation across countries, ranging from 12 users per 100 people in Algeria to 81 per 100 in Qatar (figure 7.3). Internet penetration can have beneficial effects on the economy. A 1 percentage point increase in the number of Internet users is correlated with a boost in exports of 4.3 percentage points and with increases in exports from low-income to high-income countries of 3.8 percentage points (Qiang, Rossetto, and Kimura 2009). But Internet diffusion in many countries has been hindered by the lack of broadband access and by international bandwidth that lags well behind demand.
behind many potential competitors. In 2009 available Internet bandwidth per capita was 18 to 20 times greater in Bulgaria than in Tunisia, Morocco, and Jordan. The price per megabit in Bulgaria was three times lower than in Morocco, five times lower than in Tunisia, and 45 times lower than in Jordan (CMI, World Bank, and IsDB 2012).

The telecommunications sector plays an important role in the economies of the region. Telecommunications revenues account for about 3.5 percent of GDP in Egypt, 4.2 percent in Tunisia, 4.6 percent in Morocco, 4.9 percent in Lebanon, and 6.5 percent of GDP in Jordan. These shares are generally higher than in Western Europe, where the figure ranges between 1.5 and 4 percent of GDP. The range is between 3 and 5 percent of GDP in Eastern Europe (Hätönen 2012). Telecommunications operators in the countries covered by the European Investment Bank’s (EIB’s) Facility for Euro-Mediterranean Investment and Partnership (FEMIP) have invested between 10 and 25 percent of their revenues in their respective countries, similar to the levels reported in Western and Eastern Europe. Cumulative investments in telecommunications infrastructure and services in the FEMIP countries came to about €500 million in 2011, creating new employment opportunities and significant economic benefits in the region. The share of employees working directly in the telecommunications sector ranges from 0.25 percent to 1.25 percent of the total workforce in the FEMIP countries (Hätönen 2012).

Yet countries need to do more to leverage ICT for enhanced competitiveness. The differences in ICT use and impact across the region are so vast as to constitute a digital divide (WEF 2012). The Gulf Cooperation Council (GCC) countries stand on one side of that divide, with five of them ranked between position 27 (Bahrain) and 40 (Oman) of 142 countries covered in the World Economic Forum’s (WEF’s) Global Information Technology Report 2012. The rest of the MENA countries stand on the other side of the divide (box 7.1).

Young people are key consumers of technology and a major force shaping the ICT sector. As in the rest of the world, youth has been the primary driver behind technology uptake in the MENA region. Many of the region’s young people use the Internet as part of their daily lives: for social applications such as Facebook, Twitter, YouTube, and peer-to-peer file sharing; for educational purposes through the use of Google, Wikipedia, Yahoo, and other search engines; and for entertainment to play games, download music, or watch videos online. The number of Facebook users in the Arab region grew 78 percent in 2010, while in Tunisia the proportion of users increased 8 percent in the first two weeks of January 2011, following the beginning of demonstrations (Kelly and Rosotto 2012). Using Web 2.0, youth also generate digital content from mobile phones to social media. In MENA 85 percent of mobile phone owners use them to access the Internet and to download applications to social media. In MENA 85 percent of mobile phone owners use them to access the Internet and to download applications (La Cava, Rossotto, and Paradi-Guilford 2011). Given the high Internet usage of this segment of the population, young people will be the main driver of increased demand for digital content and, in turn, increased demand for bandwidth and speed.

But even among young people, there is a digital and gender divide in MENA. The gender gap in mobile phone ownership is twice the global average, with women 24 percent less likely to own a mobile phone. Only 37 percent of Facebook users are female, compared with 56 percent in the United States. Twice as many MENA men as women use Twitter, contrary to the global figure of 55 percent female users. The regional gender gap in technology use is narrowest in Jordan and Lebanon. In Jordan, for example, women account for 45 percent of all Internet users. With respect to the digital divide among young people, addressing challenges on the supply side (for example, lack of competition) and the demand side (affordability, lagging education and literacy) will enable youth across the region to reap the benefits of ICTs (La Cava, Rosotto, and Paradi-Guilford 2011).

Despite some progress, there is still much to be done to expand broadband capacity and to spread ICT usage, both of which are essential to improve productivity. Average bandwidth in the region is low at around 1 megabit (Mb) per 1,000 people, compared with 40 Mbs/1,000 people in the United Kingdom and 30 Mbs/1,000 people in France (WEF 2010). High prices for ICT services are a constraint on their use and on the competitiveness of the economy, a situation that in several countries can be traced to the presence of monopolies in certain segments. In 2008 Egypt, Lebanon, Syria, and Tunisia still maintained monopolies over international long-distance communication calling. Lebanon still had a monopoly on mobile service. Internet service was partly competitive in Syria and Tunisia. With voice penetration approaching saturation in many Middle Eastern markets and Internet penetration taking off, the region stands on the edge of exponential growth in broadband connectivity (figure 7.4)—an opportunity that it cannot afford to miss.

Increasing the contribution of ICTs to growth

The ICT sector can be a major source of growth, as has been the case in the developed and emerging economies. IDC (2011) defines the Internet economy as the sum of the value of the goods and services exchanged over the Internet by businesses and consumers, plus the value of investments

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5. Western Europe: Belgium, Denmark, Germany, Greece, Spain, Ireland, France, Italy, Luxembourg, Netherlands, Austria, Portugal, Finland, Sweden, and the United Kingdom. Eastern Europe: Bulgaria, the Czech Republic, Estonia, Cyprus, Latvia, Hungary, Poland, Romania, Slovenia, and the Slovak Republic.
6. The FEMIP includes Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia, and the West Bank and Gaza.
7. The WEF’s Global Information Technology Report 2012 covers 142 countries, both developed and developing. Most GCC governments have embraced ambitious digital strategies coupled with pro-business reforms and infrastructure development to attract foreign investors and to diversify their economies. This government-led push is reflected in the strong performance achieved in several dimensions of the report’s networked readiness index (NDI). See http://www3.weforum.org/docs/Global_IT_Report_2012.pdf.
With an NRI ranking of 27 (out of 142 countries covered by the World Economic Forum’s Global Information Technology Report 2012), Bahrain leads the Arab world, thanks to a fairly sophisticated enabling environment for entrepreneurship and innovation, coupled with good information and communication technology (ICT) readiness (in terms of infrastructure, affordability, and skills). This process has been government led and not yet followed with the same intensity by the business community. As a result, higher rates of innovation and shifts toward knowledge-based activities have yet to appear in the country. Efforts to integrate ICT into a more general innovation ecosystem at the corporate level should help to boost the desired economic impacts of ICT, and of technology more broadly.

Qatar follows closely in position 28. Qatar has created one of the region’s best environments for entrepreneurship and innovation, evidence of the government’s strong commitment to boosting ICT-related infrastructure and spillover effects across the economy. On a less positive note, the low level of competition in the ICT and telecommunications sectors affects the overall affordability of accessing ICT, especially broadband, hindering a wider diffusion and usage of ICT (such as of broadband Internet subscriptions) across the country.

The United Arab Emirates (UAE), in 30th place, presents a profile similar to that of Qatar, with good ICT-related infrastructure, thanks to the government’s commitment to use ICT to diversify its oil-dependent economy. The UAE could derive further benefits by expanding its overall skill base and increasing participation in tertiary education. Liberalizing the ICT and telecommunications markets would help reduce the high costs of accessing the Internet.

Saudi Arabia, in 34th place, has recognized the importance of ICT as a key driver of its economic transformation. A strong government-led effort to prioritize ICT, coupled with a very favorable environment for business development, has yielded fairly good results, especially in terms of infrastructure development. But as in the case of the UAE and Qatar, immediate priorities should include boosting competition to reduce the costs of communications, improving the skill base by reducing adult illiteracy, and increasing participation in tertiary education. All would further increase ICT uptake.

Despite fairly good ICT-related infrastructure development, Kuwait, at position 62, is hindered by the high costs of access and the population’s relatively low level of skills. As a result, it shows fairly poor rates of ICT usage that, coupled with a less business-friendly environment for entrepreneurship than in other Gulf Cooperation Council states, result in low levels of ICT impact.

Jordan is in 47th place. Despite the need to improve its ICT infrastructure, especially in terms of getting access to greater international Internet bandwidth, the country—led by the government’s strong commitment—has managed to liberalize markets and improve its business and innovation environment, although some weaknesses remain.

Tunisia ranks 50th due to strong government commitment. Improving affordable access to a more robust ICT infrastructure and developing digital content would help improve ICT uptake by individuals and businesses.

Egypt is in 79th place. Upgrading the country’s ICT infrastructure, developing more digital content in Arabic, improving the general environment for entrepreneurship and innovation, and enhancing the skill base are needed to encourage higher and more homogeneous usage.

Morocco (91), Lebanon (95), Algeria (118), and Syria (125) all suffer from important weaknesses in ICT development that hinder their capacity to take full advantage of the benefits accruing from the deployment and use of these and other technologies. Low levels of ICT infrastructure development, coupled with insufficient available skills, translate into low uptake of technology by all agents, especially the business community and individuals. In the case of Algeria, the unfavorable business environment hampers the capacity of already-scarce efforts to achieve economic benefits from technology. Addressing these weaknesses will be crucial to start the national economy toward more knowledge-rich and productive activities.

Source: WEF 2012.

made to deploy, access, and use the Internet. In the European Union (EU), estimates suggest that the Internet economy represented as much as 4 percent of GDP in 2010. According to a recent study by McKinsey, the Internet’s impact on global growth is rising rapidly. On average, the Internet contributes 3.4 percent to GDP in the 13 countries studied (the G-8 plus Brazil, China, India, South Korea, and Sweden). It accounted for 21 percent of GDP growth over the past 5 years among the developed countries, a sharp acceleration from the 10 percent contribution in the past 15 years. Most of the economic value created by the Internet falls outside of the technology sector, with 75 percent of the benefits captured by companies in more traditional industries. The Internet is also a catalyst for job creation. Among 4,800 small and medium-sized enterprises (SMEs) surveyed, the Internet created 2.6 jobs for each job lost to technology-related efficiencies (Pélissié du Rausas and others 2011). In Egypt the ICT sector’s value-added reached $5.6 billion in 2009, corresponding to 3.8 percent of GDP. Moreover, in 2009, it recorded the highest growth rate of all industries in the country (UNCTAD 2011).

Digitization in the MENA region contributed $27 billion to economic growth and generated 1.3 million jobs between 2007 and
2010 (Booz and Company (2012). But ICT’s share in total exports from the region is stagnant at about 1 percent, well below the world average of 12 percent. This need not be so, as Egypt has demonstrated. According to the WEF (2012), Egypt has introduced ICT into its educational system, developed e-content, created technology parks, developed incubators to encourage the creation of SMEs focused on ICT, and established an ICT trust fund that uses ICT to promote and enhance the performance of these enterprises. As a result, it has emerged as one of the largest ICT exporters in the MENA region, with 27 percent annual growth in ICT service exports between 2005 and 2009. Such efforts need to be accelerated throughout the region so as to allow ICTs to make a greater contribution to growth, export diversification, and job creation.9

Several countries of the region, such as Oman, Tunisia, and the UAE, have made progress in developing the legal and institutional framework for secure electronic transactions,10 which can, for example, help spur development of online sales and allow businesses in the region to capture a larger share of offshore business processes, an area in which Egypt and the UAE are already top competitors (A.T. Kearney 2011).

9 In Egypt’s ICT sector targeted government policy, more than any other factor, has played a vital role. In 2004 the government established the Information Technology Industry Development Authority to develop the ICT sector and boost its exports. A partnership between the Ministry of Communications and Information Technology and the private sector, the Authority is dedicated to developing IT in Egypt. It runs an education program called EduEgypt that liaises with universities to train students for careers in business process outsourcing. The government also created special technology parks for promoting ICT service exports. The idea behind the Smart Village, which was inaugurated in 2004, was to create a space where IT companies could operate within a community conducive to their business needs (Goswami, Mattoo, and Sáez 2012).

broadband infrastructure for the delivery of ICT-enabled services increase in importance, the severe lack of broadband development will quickly become a binding constraint on the ICT market in the region, impeding the delivery of ICT-enabled services.

The evolution of mobile telephony in the region is contrasted with that of broadband penetration in figure 7.6. While mobile penetration has taken off, broadband penetration remains rather low for several reasons. Internet service providers are few, as dominant operators control most of the Internet infrastructure. On the demand side, local content is underdeveloped. Governments have tended toward restricting access to information, limiting the transparency of government action, and offering few opportunities for citizens to engage in civic and political life. While these multiple restrictions still exist, there is a large untapped demand for information and Internet access, and recent events place a strong emphasis on the need to promote legal and policy reform to increase freedom of access to information.

Progress in broadband connectivity is doubly important because it creates opportunities for new services to emerge and for existing services to expand, such as business process outsourcing (BPO). The MENA region’s geographic proximity to Western Europe is complemented by the widespread use of French and English in the region. Some service-sector-oriented and resource-poor countries in MENA are well placed to exploit this opportunity, thanks to their educated, multilingual workforce. (Examples include Egypt, Jordan, Morocco, and Lebanon.) The right kind of telecommunications infrastructure in these countries would make them an attractive destination for investments in the BPO sector.

**BOX 7.2**

**The state of broadband in the countries of the Facility for Euro-Mediterranean Investment and Partnership (FEMIP)**

The broadband market is still in its early stages of development in the FEMIP countries (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia, and the West Bank and Gaza), except in Israel, where fixed broadband penetration—DSL, cable, fiber (FTTC, FTTH), fixed WiMAX, and satellite technologies—stood at 81 percent of households in 2010. Penetration in all other FEMIP countries is still lower than 20 percent of households, except for Jordan and Lebanon, with penetration rates of 23 percent and 34 percent, respectively. Penetration of mobile broadband—HSPA, HSPA+, and LTE technologies—has been growing rapidly in recent years in most FEMIP countries, reaching 36 percent and 17 percent of households in Israel and Jordan in 2010, respectively. Mobile broadband penetration in Morocco, Egypt, and Syria has exceeded the penetration of fixed broadband. Mobile broadband has not yet been launched in Lebanon, Algeria, or the West Bank and Gaza.

The total number of fixed and mobile broadband subscribers in all the FEMIP countries reached approximately 9 million in 2010, with Egypt accounting for 31 percent of subscribers. Broadband penetration reached 41 percent of households in Jordan in 2010, whereas it remains extremely low in Syria, at 5 percent of households.

Prices for a fixed broadband subscription of up to 1 Mb range from €9 per month in Morocco to €63 per month in Lebanon. Syria and Lebanon are at the upper end of FEMIP countries in terms of fixed broadband prices, whereas Morocco, Egypt, Tunisia, and the West Bank and Gaza have the lowest prices. The broadband packages available in Algeria, Israel, Morocco, and Tunisia offer unlimited data usage, whereas other FEMIP countries have imposed usage caps on their broadband offers.

The price for the cheapest mobile broadband packages available in each FEMIP country ranges from €3 a month in Egypt to €25 a month in Syria. Mobile broadband is in direct competition with fixed broadband in most FEMIP countries, and sometimes the prices for mobile broadband are cheaper than for fixed broadband, as in Egypt, Jordan, and Syria. Prices for 1 Mb fixed and mobile packages are relatively high—even in nominal terms and certainly as a percentage of monthly disposable income. For instance, in the European Union, the typical price for a similar package is around €10 per month for mobile and €15–€20 for fixed line, where minimum offerings today provide 4 Mbs.

Source: Hätönen 2012.
Most countries in the Arab region have successfully opened up their markets to competition in mobile communications, reaping excellent results in terms of penetration and service extension. Even so, market liberalization in the mobile sector came rather late to the MENA region as compared to the rest of the world. Jordan and Morocco were the first countries to issue second mobile licenses in the late 1990s, and Morocco was one of the first countries to award 3G licenses in the region, while the more-developed GCC countries were rather late in opening up competition in the fast-growing mobile sector. The UAE and Saudi Arabia, for example, had incumbent monopoly operators that did not see competition until 2005.

At the moment mobile tariffs in the Arab world are more than twice those in Asia (figure 7.7). Countries such as Egypt, Morocco, and Tunisia could do more to complete this reform agenda and bring down prices further. India leads the world in call centers and offshore services. Although many factors have led to this outcome (Radwan 2006), having a competitive domestic industry and low-cost voice and data services are important components that the MENA countries could replicate.

Countries in the region have been slow to extend liberalization to other telecommunications segments (Rossotto and others 2011). Jordan and Bahrain are alone in the region in having implemented full competition in telecommunications (though they still need to strengthen the regulations and institutions that govern competition). Elsewhere, barriers to entry in the data, fixed-line, and international calling markets still present considerable entry barriers. Whereas all countries in Europe and Turkey have full competition in all networks and services, most countries in the MENA region have a de facto monopoly over the domestic backbone, relying on the network of the incumbent operator, resulting in high prices and low quality. Some of the major utility companies11 have deployed or plan to deploy fiber-optic cable for their own use, but it is
still uncertain whether the abundant spare capacity can be used for telecommunications purposes.

Governments have allowed only a few politically connected players to operate in the telecommunications sector. In the international gateway segment, for example, governments in the region have allowed only a few players, making it easier to control the Internet. Asymmetric conditions placed on the award of 3G licenses distorted the market in mobile telephony and broadband. Meanwhile, regulatory frameworks, regulators, and antitrust authorities in the region remain weak and often are captured by vested interests usually linked to the government and to powerful groups. Monopoly power and cartelization of the economy is a major concern, one that extends well beyond the ICT sector.

The ICT sector is therefore only partially liberalized, preventing the Arab region from achieving the benefits of full competition that already exist in other regions, such as Latin America and Eastern Europe. MENA countries would do well do take a reform path similar to that followed by the Eastern European countries and Turkey, setting a date for full liberalization as a short-term objective and issuing as many telecommunications licenses as the market demands, eliminating all restrictions to entry, and abolishing the “discretion” reserved for governments to decide on the number of operators. To make further progress in this sector, governments need to fully liberalize the telecommunications sector, step up competition, increase broadband capacity, and upgrade mobile technology by moving toward 4G licensing and using it to give existing operators full telecommunications licenses so as to foster greater competition (CMI, World Bank, and IsDB 2012). Finally, as the region moves to a more competitive telecommunications sector, governments will need to review and develop policies toward rural areas, which often are not attractive to profit-oriented operators. An example worthy of consideration is Saudi Arabia’s universal broadband service in rural areas (Dymond 2012).

Making more effective use of ICT applications

There is vast potential to use ICTs for the delivery of government services in education, health, business, and other economic activities. Areas with strong potential in the MENA region include Arabic and Islamic services and applications, IT services and smart devices for the energy and utilities sectors, e-education and e-health systems, and devices and systems for urban and infrastructure management to complement the development of several so-called economic cities (Booz and Company 2011). For example, the ongoing ART/ISiMED project in Tripoli, Lebanon, includes the creation of a customiz- able geographic information system (GIS) platform that has allowed the city to create and maintain a directory of streets and postal addresses and to better plan municipal services (UNDP and CMI 2012).

A variety of ICT applications for e-learning, e-health, e-money, and e-government show great potential in the region. With respect to Internet use in schools, country variations are wide, with the Internet reaching 100 percent of schools in Bahrain, 80 percent in Jordan and Tunisia, but only 20 percent in Morocco and almost none in the low-income countries. An example of using ICTs in education is the Jordan Education Initiative, created to leverage public-private partnerships (PPPs) to improve the application of ICT in grades 1–12. Online health information systems can also convey knowledge to the region from the technological frontier and bring needed health services to citizens in disadvantaged areas of the region. An e-health pilot in Tunisia allows users of health services to report on the quality and availability of health services, a reporting model that creates accountability feedback loops from people to the authorities. In 2012 the prime minister’s office in Tunisia created a citizen scorecard on health—the Tunisia National Health Insurance Fund Scorecard (in Arabic)—to further inform the authorities and the public about citizens’ views on how to improve and reform health services (Elgazzar 2012). A successful example of how to facilitate job matching comes from SoukTel, which provides a mobile-phone-based service called JobMatch to reduce the gap between demand and supply of labor in Morocco and the West Bank and Gaza (www.souktel.org).

ICTs can accelerate the opening up of government data, make e-procurement possible, and enhance citizen engagement to improve government transparency and accountability. In 2009, for example, Lebanese citizens were encouraged to send SMS reports on irregularities in the parliamentary election to the citizens’ reporting project known as Sharek961.org. Morocco was also the first country in MENA to provide at least a portion of government data online (https://data.gov.ma). Opening up such information is an important way to facilitate data-driven accountability of government to citizens. In this spirit, the Open Development Technology Alliance (ODTA; www.opendta.org) is a knowledge platform that aims to give voice to citizens and improve accountability by offering ways to provide feedback on public services. This will help to make governments more accountable for the public services they provide.

The United Nations E-Government Survey 2012 finds that many countries in the world have already put in place e-government initiatives and ICT applications to boost public sector efficiency and support sustainable development (UN 2012). Tunisia’s national government portal (www.tunisie.gov.tn) provides quick access to information on services such as obtaining a driver’s license or acquiring personal and home loans. Also, under a new social accountability policy supported by the World Bank

11. Such as Tunisia’s electricity and gas utility STEG, the Egyptian railways, and Morocco’s electricity utility ONE.
in 2011, the office of the prime minister in Tunisia created the Barometer of Public Services, its first citizen scorecard platform to build social accountability and good governance in public services. The initial results of this scorecard were published in Arabic in 2012 on the main page of the prime minister’s Web site (Elgazzar 2012). E-government is also part of Morocco’s Maroc Numéric 2013 strategy. Saudi Arabia’s YESSER initiative is profiled in box 7.3.

Despite some progress, e-government applications are not yet sufficiently developed in the region to create an environment conducive to enhanced productivity. The public sector has a greater role to play in developing e-government applications that can provide citizens with public services and timely information. Special attention should be devoted to facilitating trade through electronic data interchange and e-customs for filing declarations and paying duties and to improving the business environment through online registration, e-taxation, e-procurement, and e-payment. Mobile payments can improve the efficiency of the financial sector, widen access to financial services, and increase the efficiency of government services such as cash-transfer programs. Efforts to expand e-government services could be combined with efforts to simplify administrative procedures, widen the dissemination of public information, expand computer training and Internet use in schools, and develop online educational content and e-learning applications.

Smart ICT and Internet applications also have the potential to improve the environment and tackle climate change. Top areas of application are manufacturing, energy, transport, and building construction. A better understanding of smart ICTs provides policy makers with options for encouraging clean innovation and greener economic growth. ICTs can also support sustainable growth and employment through smart grids, smart meters, smart buildings, intelligent transport systems, and smart cities—all significant opportunities waiting to be exploited (OECD 2010).

Finally, ICTs are reshaping the global job market. They are opening up new frontiers and are enabling new job trends through opportunities such as micro-work, ICT-enabled contracting, online gaming work, and in the growing “app” economy. These new trends have risks and benefits. But with the appropriate enabling conditions, they can create jobs and new income opportunities. ICT-enabled work can be performed anywhere through regular computers and Internet connections, has low entry barriers, offers high flexibility in skills requirements, and is resilient and countercyclical to economic downturns. Finally, as forms of telework or virtual work, these trends may have a positive environmental effect by reducing commuting and delivery costs (Rossootto, Kuek, and Paradi-Guilford 2012).

Thus, the development of IT-based services and the improvement of IT skills among the labor pool can increase productivity, generate new jobs, and accelerate economic growth. In MENA there is a mismatch between the talent pool and industry requirements. This situation should be addressed, because ICTs offer opportunities for young people to enter the job market, providing flexibility in the value chain and enabling them to compete for higher-level jobs based on their skill advantage in technology. Figure 7.8 maps the degree of employment formality and compensation potential of a variety of ICT jobs open to young people around the world. The creation of easy-to-use and accessible software services can dramatically reduce the barriers to employment by enabling micro-tasking and crowdsourcing (Chamlou 2012). The job-creation potential of ICTs in MENA is discussed further in chapter 8.

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13. The World Bank is currently assessing the feasibility of micro-work to promote socioeconomic development and enhance employment opportunities for youth and women in the West Bank and Gaza (Internal Background Report, 2012).

14. Crowdsourcing is a process that involves outsourcing tasks to a distributed group of people. This process can occur both online and offline. The difference between crowdsourcing and ordinary outsourcing is that a task or problem is outsourced to an undefined public rather than a specific body, such as paid employees; http://en.wikipedia.org/wiki/Crowdsourcing.
Chapter 7: Moving toward an information society

Developing IT skills for employment, entrepreneurship, and innovation

There is no doubt that ICTs can create new job opportunities for people with different degrees of skill, circumvent some of the rigidities of the labor market, and foster innovation. Table 7.1 lists some ICT-focused actions that can be implemented to meet the needs of specific segments of the labor market, starting with the action that can reach the most job seekers and produce the quickest wins to ease unemployment. Some of these actions are further explored below.

Low-skilled workers

Platforms for micro-tasking and crowdsourcing can provide marginal additional compensation disbursed via mobile phones and other ICT-enabled tools. Through a flexible work environment, such platforms can accommodate disadvantaged groups such as women (for example, stay-at-home mothers) and connect the labor force to local, regional, and global labor markets. This approach is virtually new to MENA, but it can have a transformational impact on the effectiveness of community development programs, in line with regional priorities.

Medium- to high-skilled workers

Skills used in IT-enabled services and BPO are fungible across sectors and can therefore have major cross-cutting impact in terms of employability. Job creation in BPO also has a multiplier effect on employment and can be linked to community development programs, in particular those targeting rural youth and women.

Entrepreneurship and start-ups can be financed through prize competitions and crowdfunds. Through competitions in business planning, application development, and other areas, young entrepreneurs and start-ups can rapidly increase their public exposure and improve their access to industry clients and sponsors, funding, and other support. Crowdfunding can increase young entrepreneurs’ access to capital beyond the domestic and more traditional financial institutions. Taking advantage of competitions and crowdfunds will require partnerships with the private sector that provide aspiring entrepreneurs and start-ups with better-equipped business incubators and mentoring networks.

Skills development can be linked to entrepreneurship and business incubation through the creation of cooperative platform spaces, often within universities. These enable students and unemployed youth to put their skills to use by preparing dem-
transforming Arab economies

Employment through freelancing and e-lancing platforms, as well as open platforms for cocreation of applications and digital content, is already a rapidly emerging trend in many countries where applications development is increasingly linked to the needs of users and consumers. For example, in Europe, the Living Labs and their cross-border networks are becoming essential parts of application development, enabling the cocreation of products and services through user-driven research in real-life scenarios.

Highly skilled workers

Some MENA countries rank high as an attractive destination for high-end BPO. For these countries, creating skill-certification programs that are tailored to the needs of the BPO industry would be useful. Egypt has established a useful track record of developing foundational skills for BPO under its EDUEgypt program (http://www.eduegypt.gov.eg), which offers an opportunity for quick scale-up. Also needed are national technology foresight exercises that can facilitate cross-sectoral cooperation and break down silos in industry, academia, and government. Such strategies can make MENA stakeholders attractive partners for global ICT players, identify opportunities for PPPs, and pave the way to international cooperation.

All skill levels

ICT applications that match young job seekers with employment opportunities can build on readily available mobile technology to increase access to local, regional, and even global opportunities for job seekers with a wide range of skills in rural and urban areas. Through these applications, such as Souklet.org in Palestine, job seekers can submit basic information on their skill sets to a database through their mobile phones, where employers can select them for specific opportunities.

Building enabling environments for private sector development and for electronic and mobile money transfer can stimulate growth of the local IT industry (especially labor-intensive segments) and make use of ICTs to improve the business environment (affecting business registries, customs procedures, and so on). Mobile financial services and other forms of branchless banking can support micro-work and crowdsourcing in areas where a more traditional banking infrastructure is missing.

The promotion of Arabic-language content on the Internet holds great potential for the region. Arabic is the world’s fifth-most widely spoken language but only the eighth-most commonly used language on the Internet. Increasing numbers of Arabic speakers use Twitter (40 percent of whom reside in the UAE). But most Internet users in the region rely on English and French. According to a survey by Ipsos, 96 percent of the social network sites used by Arabs are in foreign languages, with only 4 percent in Arabic, a situation that suggests the opportunity to develop more Arabic content (La Cava, Rosso, and Paradi-Guilford 2011). The digital content industry in Jordan received a boost in 2009, when Intel announced plans to invest in two digital content companies: Jeeran and ShooFeeTV. The funding would be used to help both companies pursue regional growth and extend their product offerings. Jeeran is the largest user-generated content site in the Arab world, reaching 1 million members and 7 million unique visitors per month. ShooFeeTV provides online information for more than 120 Arab satellite channels, including programming information, pictures, and video clips (Kelly and Rosso 2012).

Wikipedia has also launched an interesting initiative in this regard. While the English version of Wikipedia has about 3.8 million articles, the Arabic version has only 150,000, despite the fact that there are 400 million Arabic speakers globally. To increase its editor base, Wikipedia has launched a pilot program in Cairo, where students will edit and write for the online encyclopedia as part of their class assignments under the guidance of their professors (Chaudhuri 2012). More such initiatives should be encouraged to strengthen inter-Arab linkages, where the Arabic language is the binding force.

Regional cooperation in ICT promotes regional integration more generally, as reflected in the regular meetings of the Arab ICT Council of Ministers. Regional cooperation can take various forms, including cooperation on telecommunications infrastructure, policies, and finance. The sharing of expertise and joint initiatives among the member countries of the UN Economic and Social Council for Western Asia (ESCWA), for example, can link them to each other as well as to other Arab countries outside the ESCWA region. The ESCWA has developed an information society portal for the exchange of information. It is working on a regional framework for the deployment of broadband in the region.
and a legislative framework for e-government. From 2005 to 2010, the ESCWA provided regular advisory services on e-government applications to the governments of member countries.

In terms of cooperation with the EU, some programs deserve mention. The Euro-Mediterranean Information Society Initiative (EUMEDIS) aims to help develop an information society by promoting ICTs in participating countries. It has funded regional pilot information society projects in five priority sectors, namely health-care networks, electronic commerce, tourism and cultural heritage, industry, research and innovation, and education. In 2009 EUMEDRegNet was started to further improve the mutually beneficial cooperation on an information society between Europe and the Mediterranean partner countries, building on the achievements of the EUMEDIS and other regional initiatives. The New Approaches to Telecommunications Policy (NATP II) program assists regulatory authorities in Mediterranean partner countries in their efforts to liberalize their telecommunications markets.

Conclusion

A competitive ICT sector is known to be a prerequisite for improving information infrastructures. Together, adequate infrastructure (particularly a good ICT backbone) and a competitive environment are factors that define a country’s ability to embrace the knowledge economy. The MENA region has made rapid strides in recent years in expanding access to telecommunications services, but the advances are largely confined to mobile telephony. Access to landlines has remained almost static in many countries, and Internet access remains costly and bandwidth limited. The region can learn from its success in mobile telephony by expanding the conducive business environment needed to foster competition and galvanize the private sector to provide high-quality services at a reasonable cost.

Governments across the region thus need to focus on the unfinished reform agenda. Priority actions in the telecommunications and Internet sectors can help to foster economic growth, international connectivity, and more open governance. Chief among those actions are the following:

- Full liberalization of ICT networks, and proactive strengthening of regulatory agencies and competition authorities. Medium-term reforms include developing a more balanced legal and regulatory framework for ICT. To ensure that MENA countries can reap the benefits of fair competition, the independence and capacity of regulators must be enhanced. Antitrust authorities, in particular, need to be considerably strengthened. Control of monopoly power and of economic cartels should be considered as a top priority.
- Telecommunications and media are usually priority sectors for antitrust monitoring and action.
- Stronger competition on backbone networks and in international connectivity. Market entry by competing operators should be encouraged at the backbone level, by, among other means, leveraging the investments of utilities that have already laid down fiber-optic cables for domestic or international connectivity. Increased competition that decreases the government’s control of the core network also reduces the chances of a catastrophic network shutdown.
- Protecting users’ privacy, guaranteeing intellectual property rights, and ensuring freedom of expression. This means shifting from the old state-centric landscape to a new, more open one that appropriately balances security and privacy interests, supports transparency and user privacy, and maintains a more resilient network infrastructure.

Governments can promote this evolution by increasing ICT spending, promoting e-government services, and subsidizing IT training within government as well as promoting ICT literacy in schools throughout the region. A broad approach to regulatory reform in ICT should include legislation that ensures freedom of information and expression. The legislative approach should support media plurality and independence and promote open access to government data.

The Arab region could also greatly benefit from increased trade in software and technology services across the region and from technology-driven ICT convergence of the Internet, media, and communications. For instance, regional platforms for transport management systems, e-health services, geospatial referencing applications, and many other vertical software sectors are emerging as important elements in the ICT landscape of the region. In this context, ICT liberalization and harmonization on a regional scale could play a major role in boosting the development of the ICT industry. This would involve (i) harmonizing regional telecommunications policy and regulation; (ii) developing ultra-fast broadband; (iii) developing regional platforms for mobile applications; and (iv) supporting regional integration in the trade of IT/ITES services (Chauffour 2011).

In summary, parts of the telecommunications sector have registered rapid growth in recent years in the Arab world, spurred by reforms that have opened markets and introduced competition. But much more can be done to raise competition in the sector, spread access to broadband, and ensure that ICTs are used as a lever to raise productivity, growth, and employment. As the telecommunications sector moves to a more commercial and competitive environment, governments should implement practical policies to enhance citizens’ ICT skills, which will help them become more employable, more entrepreneurial, and more innovative. Encouraging the development of Web content in Arabic is of particular importance in spreading the benefits of ICTs among the population.

18. Countries such as Morocco, Tunisia, and Jordan have an interest in becoming fully integrated and compliant with EU telecommunications regulations through full liberalization ensuring that their market structure is consistent with the EU Full Liberalisation Directive of 1998, as amended and by adopting the acquis communautaire on telecommunications regulation, privacy, and data protection.
References and bibliography


PART 3

Diversification initiatives

In this part
- Chapter 8. Promoting growth sectors
- Chapter 9. Managing local and regional development
Chapter 8
Promoting growth sectors

There is a need to diversify Arab economies toward knowledge-based sectors. Over the past decades, various geopolitical and demographic factors have shaped the growth model followed in the Arab world. In most countries, the identification of priority sectors was based on considerations of comparative advantage that emphasized resource- or location-based factors rather than knowledge-based competitiveness. The weight placed on those factors has kept much of the region in a "pseudo-comfort zone" that has led it gradually toward joblessness, poor productivity, and slow growth.  

Adding to the four policy pillars of knowledge and innovation-based development strategies, there is a need to pursue active policies to promote new sectors that can generate higher economic growth and create employment. These sector policies encompass actions to improve the four policy pillars—economic and institutional regime, education, innovation, and information and communication technologies (ICTs). Achieving high and sustained growth will require effective strategies to harness the growth potential of knowledge-based economic activities and to move up the value chains and enhance productivity. Yet few countries have identified the sectors that will drive their future growth. Fewer still have made clear plans to encourage the development of those sectors. Morocco provides an example of what is needed.

This chapter identifies several promising knowledge-based sectors—activities related to ICT, medical and health tourism, creative industries, and green energy. It discusses their major constraints and proposes a road map for reforms that will be necessary if those sectors are to fulfill their potential to generate economic growth and employment. Of course, sectors that are already well established in the region have a major role to play in enhancing economic growth in the medium term, and that role is the subject of the next section. These sectors—agribusiness, textiles, automotive manufacturing, and chemicals—are typically labor intensive and account for the majority of industrial jobs in the region. Moving up the value chain by absorbing knowledge from the world’s best practices could transform the existing comparative advantage in the Arab world into a competitive one.

Established sectors: Making the knowledge economy leap

Knowledge and innovation strategies are needed to foster growth in established industries. Higher rates of growth and job creation can be attained by upgrading the value chain of these sectors; improving their competitiveness in the domestic, regional, and international markets; exploring the potential of new niches; and providing the required policies, infrastructure, and human capital.

Agribusiness: Moving up the value chain

A sector of strategic importance, agribusiness is a subset of manufacturing that processes raw materials and intermediary products derived from agriculture, fisheries, and forestry. Agriculture (without any industrial processing) accounts for 8.2 percent of total Arab gross domestic product (GDP) and about 25 percent of total employment. But the countries of the Middle East and North Africa (MENA) region have widely varying agricultural endowments (figure 8.1). The countries of the Gulf Cooperation Council (GCC), for example, have limited agricultural resources and import most of their agrifood products, although they have great potential for the development of energy-based industries such as fertilizer production, refrigeration, and manufacturing of tractors and other farm machinery that occur upstream in the agro-industrial value chain.

Because of complementariness variations in agricultural endowments, the sector can be a source of inter-Arab economic integration. The GCC countries have little arable land (figure 8.1) but a large capacity to produce fertilizer (figure 8.2). The countries of the Maghreb and Mashreq, by contrast, consume more fertilizer than they can produce.
Most Arab countries are net importers of food (mostly grain). In 2011 net imports of food varied from $11 billion in Saudi Arabia to $280 million in Mauritania. Trade within the region to address the common challenges and to benefit from the complementarities among Arab countries has grown in recent years. Intra-Arab trade and foreign direct investment (FDI) in agro-industries have experienced an important boost, notably in the aftermath of the global food crisis of 2007–08 (Tanyeri-Abur and El Amin 2009). Several GCC countries have allocated a share of their sovereign wealth funds to be invested in agriculture or used to establish joint investment companies (such as Jannat in Saudi Arabia). Most of these investments are taking place in the Maghreb and Mashreq countries, and in Sudan.

But FDI projects in the agribusiness sector created no more than 38 direct jobs for every million euros invested between

**FIGURE 8.1**
Arable land as percentage of total land area, select Arab countries, 2008

**FIGURE 8.2**
Fertilizer consumption as a percentage of fertilizer production, select Arab countries, 2009

2003 and 2010 (ANIMA 2011). And the scale of investment flows remains small. The sector represented only 1.5 percent of total FDI flows between 2003 and 2010 in the Mashreq region and 1.9 percent in the Maghreb, compared to 4 percent in Turkey and Israel. The conclusion is that agribusiness still has not reached its full potential in the region and that the value chain of the sector needs a significant upgrade. ANIMA (2011) suggests that substantial potential lies in the commercialization of Mediterranean products (such as oils, fruits, and juices), food service (for example, airline catering, canteens, tourist restaurants), organic agriculture, horticulture, aromatic and medicinal plants, and cosmetics.

The swings in food prices over the past four years highlight the importance of agriculture both for poverty alleviation and food security. The sector employs many people who are often trapped in poverty because of low yields. Wheat yields in Morocco are 27 percent of those in Germany, for example; tomato yields in Egypt are 51 percent of those in the United States; and olive yields in Tunisia are 16 percent of those in Spain. Compounding the problem of yields are lack of market access, skill shortages, and insufficient research and development (R&D) and extension services (Zeidane 2012).

Upgrading the value chain is an important catalyst for the knowledge economy. Any industry that receives sufficient political and economic endorsement (top-down support) and continuous upgrades of inputs (bottom-up innovations) across its value chain can become competitive and integrated in the global market. In the absence of significant integration into the value chain, however, liberalization of manufacturing did not enable Egypt and Morocco to gain access to global markets (Taha 2012). Value-chain analysis makes it possible to understand the governance structure within the economy and the interactions between the different market players. Box 8.1 summarizes the common bottlenecks in the agrifood value chain in Egypt.

A comprehensive strategy is needed for the agribusiness industries. To benefit from the region’s existing comparative advantage in agribusiness and to overcome challenges, comprehensive and well-coordinated solutions and policies are required to cover all aspects of the value chain in the Arab agribusiness sector. In particular, there is a need to address the pronounced inequality of the sector, where only large commercial companies are able to afford advanced manufacturing technologies and to produce various types of products, while small and informal companies lack the quality control capacity and skills needed to new develop products. Coexistence between the informal and formal sector should be addressed within an effective framework of knowledge exchange and transfer.

The textile industry: Competing in a challenging global environment

The MENA’s textile and apparel sector has experienced fierce competition, notably with China and Turkey, since the Multi Fibre Arrangement (and its import quota system) expired in early 2005. The sector employs a significant portion of the manufacturing labor force in the region—about 50 percent in Tunisia, 30 percent in Syria, 28 percent in Egypt, and 19 percent in Jordan.

The sector is a major source of exports. In 2010 the textile and clothing sector accounted for about 25 percent of manufacturing exports from the Maghreb and Mashreq countries, ranging from 43 percent in Syria to 18.82

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**Box 8.1**

**Egypt’s agribusiness value chain**

Although Egypt has several prominent agricultural research institutes that enjoy at least regional and continental recognition (UNEP 2006), the resources for innovation and product development are limited. In addition, existing agricultural extension mechanisms do not provide adequate knowledge transfer from research centers to small farmers.

The problem of processing harvested agricultural crops in Egypt is very serious, with an estimated 20 percent of crops lost each year because of outdated storage techniques and a lack of coordination among the responsible governmental units within the supply chain (Mohamed 2010). In addition, a significant share of agribusiness activity (for example, sweets and confectionary products, soft drinks) relies on imported raw materials.

Egypt has made significant efforts to develop new ports and logistical hubs, yet inland logistics and the cold-storage logistics chain are insufficient and limited to a few market segments. Poor marketing capabilities are to blame for the 13 percent unused capacity in agribusiness.

Source: Authors.
percent in Jordan (figure 8.3). Egypt and Syria, among other countries, are endowed with the resources to create a vertically integrated industry, from fiber to end products, which explains the high ratio of textile to clothing exports in both countries. Conversely, Jordan, Morocco, and Tunisia tend to import raw materials and focus their efforts on clothing. Both groups of countries need to target higher segments of the export markets with better products that demonstrate a better understanding of the tastes of foreign markets. This cannot be achieved, and jobs will not be saved, without a comprehensive knowledge-based strategy that will enable the sector to compete for higher-value-added market segments.

The example of Tunisia, which is the fifth-largest supplier of clothing to the European Union (EU), is a useful one. As the textile sector is the nation’s largest labor-intensive industry, the Tunisian government has looked for ways to preserve its edge. To do so, it has turned to the knowledge economy. The Tunisian textile sector has taken a qualitative leap by relying on nonconventional assets: creativity, innovation, marketing, and investment in new technologies. On the local level, several research laboratories and units have been involved in textile-related subjects, most located at the University of Monastir. The university hosts three textile training institutions that offer credentials in textile engineering (70 graduates a year)^2^ environmental protection, fashion, and design. Further, at least 7 research teams and no fewer than 70 faculty researchers are working on textile-related subjects. Advanced research themes vary from studying natural materials to improving textile comfort and optimizing the production process. Consequently, Tunisia has successfully upgraded the quality of its production through clothing design, finishing, and coproduction. The shift to the knowledge economy has saved at least 204,000 jobs and 40 percent of Tunisia’s industrial exports [MEDIBTIKAR and EuroMed 2009].

The textile sector needs to tap new niches, notably technical textiles, industrial textiles, geo textiles, and medical textiles. In addition, specialized tertiary education is a prerequisite for higher value-added products. Governments should encourage national firms, and even informal small and medium-sized enterprises (SMEs), to develop strong relationships with brand-name merchandisers and to ensure the needed accumulation and upgrading of knowledge. The R&D centers that address the common challenges in the industry require greater support.

**Machinery and transport equipment: Fostering linkages with other sectors**

Machinery and transport equipment is becoming one of the region’s major drivers of growth and exports. The sector represents a large and growing share of exports: 28.8 percent in Tunisia, 20.4 percent in Morocco (expected to grow with Renault’s exports from Tangiers), and 10.5 percent in Jordan in 2010.^3^ It is expected to benefit from high domestic demand, as households catch up in terms of household appliances and car equipment. Currently, Tunisians are the best equipped in

FIGURE 8.3
Exports of textiles and clothing as a percentage of total manufacturing exports, select countries, 2010


^3^ Authors’ calculations based on World Trade Organization (WTO) data [accessed June 2012].
the region, with 125 cars per 1,000 inhabitants (but still well behind Europe, with 586).

It is expected that the region’s demand for new cars will grow faster than ever. According to the Economist Intelligence Unit (EIU 2011), high international oil prices have propelled significant growth over the past decade in the new car market in the Gulf countries. For instance, Saudi Arabia’s market has seen sales multiply fivefold, and car registrations are expected to increase 11 percent annually between 2011 and 2015.

The manufacture of equipment in specialized transport niches is very promising in terms of job creation and economic growth. The niches include low-cost cars and automotive components (such as wiring harnesses, gearboxes, and brake systems). Although the sector is still in its early stages in the region, these industries are expected to induce many backward linkages with other sectors. For instance, aeronautics in Morocco, which provides about 8,000 jobs, relies on many other industries, such as mechanical manufacturing (representing 19 percent of inputs), maintenance (13 percent), and electronics and electricity (11 percent). Nevertheless, nearly all of the output of this sector is sold to parent companies (about half of the production is exported) (ODE 2008), choking off forward links. The sector’s output is still concentrated in the early stages of the value chain despite the multiple opportunities in the market.

The sector has a significant positive impact on job creation. In fact, it has the second-highest potential for net job creation in Tunisia between 2011 and 2016, with more than 70,000 jobs predicted by McKinsey & Company (e4e, IsDB, and IFC 2011). But harnessing the potential for growth will require, among other things, an adequately skilled and competitive workforce (including highly qualified technicians). Finding skilled workers represents a major challenge for the machinery, electrical, transport, and electronics industries, which have witnessed rapid growth in production and exports but are still impeded by shortages of skilled workers, insufficient vertical linkages with domestic suppliers, and low (though increasing) clustering of businesses, training institutions, and research centers—all operating in alignment with knowledge and innovation policies.

The chemical industry: Maximizing a strong comparative advantage

Chemical industries comprise a large number of products that are essentially converted from raw materials, notably the region’s abundant oil and natural gas resources. By leveraging those resources for expansion, the Arab world could become a key player in the global petrochemical market.

The chemical industry already accounts for a significant share of manufacturing in many Arab countries. For example, it represents 22 percent of manufacturing in Egypt (which has a petrochemicals subsector that is competitive thanks to gas exports to the GCC countries), 20 percent in Tunisia, 16 percent in Jordan, and 14 percent in Morocco. Despite wide variations in productive capacity, 62 percent of the region’s chemical production in 2006 was concentrated in five products (Bloominvest Bank 2010): urea (16 percent), ammonia (13 percent), ethylene (14 percent), methanol (11 percent), and polyethylene (8 percent). Therefore, Arab countries are in a position to gain more from the sector by developing more end products, since the price of such value-added products would be much less sensitive to changes in raw materials prices.

The manufacturing of chemical, rubber, and plastic products constitutes an industry that is one of the major employers in several countries in the Arab world. Moreover, the indirect effect of job creation from the chemical industry is significant. For each direct job created, up to 6.5 indirect jobs are created in other industries (Bloominvest Bank 2010). The sector accounts for 22 percent of manufacturing employment in Saudi Arabia and Iraq, 17 percent in the United Arab Emirates (UAE), and 16 percent in Bahrain and Oman (AIDMO 2010). In addition, the sector absorbs a large share of the region’s skilled labor. For example, in Tunisia, 20 percent of employees in the chemical industry have at least a university degree, and 50 percent a secondary education degree. Owing to the shortage of domestic skills in some countries, however, employers depend on foreign know-how. One-third of the 30,000 employees of SABIC, for example, which is the dominant player in the region and based in Saudi Arabia, are estimated to be foreigners. The fact is that the industry’s expansion in the region is highly tied to the availability of a sufficiently large pool of qualified labor. Several projects have been delayed because qualified workers could not be found. In the short term, it is expected that development trends in the sector will be closely linked to the growth of demand in emerging markets, notably in the BRICS countries (Brazil, Russia, India, China, and South Africa). In the longer term, as the sector evolves, the comparative advantage of the Arab world in the chemical industry will become even greater, given the increase of the feedstock prices (notably oil and natural gas) in competitor countries, as shown in figure 8.4.

![Figure 8.4](image)

**FIGURE 8.4**

Gas costs and the cash cost of producing urea in 2012 (estimated)

Source: Morgan Stanley, Bloominvest.

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4. The number is expected to rise to 10,000 by the end of 2012, according to the GIMAS (Moroccan Group of Aerospace Industries).
Market competition in the sector is still in its early stages. Although the region has been able to attract multinational corporations to cover a large share of domestic production needs and to diversify its regional markets with Africa (which present a huge potential for growth), competition in the internal market is not yet fully developed, especially in the GCC countries. For instance, Saudi Arabia is the only country in the GCC that has opened up its petrochemical sector for private investment. Historically, the sector was led by SABIC, 70 percent of which is still owned by the state.

The chemical industry is very promising in the MENA region. If various constraints can be overcome, the chemical sector could be a major driver of growth and job creation. The most challenging limitations are related to skills, quality management, the R&D and other technological capabilities of domestic firms, market size, and funding (Zeidane 2012). Therefore, the competitive advantage of the region’s chemical sector should be coupled with supportive measures to encourage firms to innovate and to sustain their edge. The chemical industry consumes a significant amount of nonrenewable materials. Therefore, one of the niches in this sector should be to explore new biodegradable production lines through R&D activities, technology absorption, and other means, as well as new waste-treatment facilities under the umbrella of long-term environmental policies to minimize or at least control pollution costs.

ICT-related activities: Exploiting opportunities, traditional and new

The emergence of ICT had an important impact on the structure of the global economy and labor markets, as discussed in chapter 6. ICT may be the industry sector with the highest potential for innovation in the Arab world (Moutamarat and PricewaterhouseCoopers 2006). Together with telecommunications, the evolving ICT sector has already been an important source of growth and jobs in the region. Each Arab country has room to position itself in whatever branch of the sector it chooses to emphasize. In Jordan, for example, adapting international technologies for use in the nation’s ICT sector has created jobs and built skills and competence. Today, ICT is the fastest-growing sector in Jordan’s economy. Directly or indirectly it created more than 80,000 jobs between 1999 and 2009 (ICT Association of Jordan 2011), contributing 14 percent of the nation’s GDP. It has proved successful in attracting investment and business operations to Jordan, including Cisco, Microsoft, Oracle, HP, Yahoo, Intel, Motorola, and Ericsson.

Growth in the sector has benefited from a government policy of breaking down telecommunications monopolies.

Another promising example of ICT-related employment opportunities comes from Tunisia, where offshoring—business process outsourcing (BPO) and information technology (IT) outsourcing—has been identified as a viable option for job creation in the short term (box 8.2). Tunisia’s goal is to become a regional offshoring hub by creating linkages to large-scale European projects in the fields of R&D, transport, and aeronautics that involve considerable ICT skills. The country has upgraded the physical infrastructure required for a successful ICT industry—for example, by creating new competitive clusters such as the Tunis Financial Port, a project for an offshore financial center that would potentially add about 16,000 jobs.

The outsourcing and offshoring of services to less costly locations has been made possible by the increasing penetration of broadband, falling telecommunications costs, critical masses of skilled labor, and greater openness to FDI. Many countries in the region have attracted ICT-related FDI, both in telecommunications services (Vivendi in Morocco, Orange in Tunisia and Jordan, and Vodafone in Egypt, to name a few examples) and in the IT industry, in which a significant number of multinationals are active in the region. The region has also promoted the development of BPO to enlarge its ICT exports base, with positive achievements over the past decade in Tunisia (where the share of ICT in service exports increased from 1.2 to 4.7 percent, matching similar dynamism for ICT goods exports), Morocco (3.7 percent to 7.5 percent), and Egypt (3.4 percent to 4.7 percent, earning Egypt 4th place among 50 countries in A.T. Kearney’s 2011 Global Services Location Index). Recent data have shown that call centers, IT R&D centers, and software services are seen by foreign investors such as Cisco, Microsoft, IBM, and Yahoo as one of the most important niches for growth and employment, with a job intensity per million euros invested of between 103 and 299 (ANIMA 2011). Nevertheless, a huge potential for growth and exports remains untapped, considering that, globally, the average share of ICT goods in overall exports is 12 percent, much higher than the MENA rate of less than 1 percent.

Tourism: In search of a niche and a long-term growth strategy

Tourism is one of the world’s largest industries, supporting more than 258 million direct and indirect jobs and generating 9.1 percent of the world’s GDP. From 1990 to 2005 the Middle East led the world’s regions in tourism growth. With

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5. Despite the pressing demand for ICT, prices of ICT-based services have dropped by 25 percent in the Arab region between 2008 and 2010.
6. FDI related to telecommunications can be approached on two levels: (i) FDI in the telecom sector and (ii) FDI induced by improved telecom infrastructure. On the first point, liberalization of telecom markets has nearly always led to significant FDI inflows, either for the purchase of existing telecom assets, for their refurbishment, or for the development of new infrastructure. On the second point, ICTs, which make up telecom infrastructure, are expected to have a positive impact on FDI because they allow developing countries located far from technologically advanced countries to free themselves from geographical limitations and become more attractive to foreign investors. A World Bank study suggests that an improvement of 1 percentage point in telecommunications services indicators can increase FDI by 0.75 percentage point (Rossoitto, Sekkat, and Varoudakis 2003).
Chapter 8. Promoting growth sectors

BOX 8.2

Offshoring opportunities in Tunisia

Tunisia has high and growing unemployment, estimated at 13 percent in 2010 for the general working-age population and 27 percent among those aged 15–29. Because the young constitute a majority of the Tunisian population, they bear the brunt of high unemployment: of the 492,000 unemployed in 2010, 343,000 were young people. These numbers increased in 2011. Particularly hard hit are university graduates, women, and those in rural areas. The short-term economic fallout from the Jasmine Revolution—which arose in part from the frustrations engendered by the mismatch between skills, jobs, and opportunities—has only exacerbated the situation. Aware of the acute need for job creation, the transitional government of Tunisia, in its Economic and Social Development Strategy for 2012–16 (published in September 2011), outlined an approach to growth in the short and medium term. The plan identifies 10 strategic targets for the near term. Of these, four demonstrate the central role that the knowledge economy plays in promoting growth and creating jobs: (i) developing human capital, (ii) promoting science and technology, (iii) encouraging productivity and entrepreneurship, and (iv) increasing Tunisia’s integration into the world economy.

**Tunisia’s track record in offshoring.** Tunisia’s drive to participate in the global economy was launched through explicit government measures initiated in the 1970s and strengthened in the 1990s. These policies have led to a rising tide of offshoring jobs—from 10,000 in the 1980s to 70,000 in the 1990s. At 300,000 today, these positions represent 55 percent of manufacturing jobs and 8 percent of the current workforce. A.T. Kearney’s 2011 Global Services Location Index places Tunisia at a respectable 23rd spot among 50 countries, clearly indicating that it is well suited to offshoring.

**Future opportunities in offshoring.** Offshoring could account for much more employment in Tunisia (e.g., IsDB, and IFC 2011). The offshoring sector will require 50,000 trained people over the next five years (20,000 in information technology outsourcing and 30,000 in business process outsourcing, BPO). Behind that estimate are several facts: 25,000 jobs were created in the past four to five years, the Tunisian offshoring market is growing rapidly, and just 16 percent of the potential market has been captured. In IT outsourcing, the number of students completing education and training over the next five years will be roughly 45,000, of whom only 7,000 are offshore-ready (as explained below), revealing a gap of 13,000 (if 20,000 are indeed needed). Approximately 205,000 will complete BPO training over the next five years, of whom only about 10 percent, or 20,000, will be offshore-ready, a gap of 10,000. According to employers, prospective candidates are not ready because they lack one or more of three general skill sets: either (i) soft skills (critical thinking, communication skills, professionalism, teamwork, general knowledge); (ii) up-to-date technical skills; or (iii) language skills (inadequate grasp of French, English, or Italian).

**Home-grown, industry-driven response.** In the wake of the Jasmine Revolution, a Tunisian business association (Association tunisienne pour la communication et la technologie, or TACT) was formed to pursue three objectives: (i) to make Tunisia known for offshoring, (ii) to act as a think-thank on this issue for the government of Tunisia, and (iii) to help international companies establish their offshore departments in Tunisia. TACT has identified immediate challenges in terms of connectivity, infrastructure, and relevant skills. The question of connectivity is moving toward resolution, as it is now available at a reasonable rate in the country. Infrastructure—in the form of buildings of appropriate size and quality that meet international norms—remains problematic, though TACT has outlined ways to resolve this with government incentives and the creation of technology parks. As far as the necessary skills base is concerned, some initial responses have been put in place: ESPRIT, a private higher education provider, is retraining 200 unemployed youth, confident they will be successfully placed in jobs in the sector. The next step is to develop a clear, forward-looking program that helps the Tunisian government realize the potential of this sector in the short term.

**Framework for systematizing industry-driven responses.** The World Bank is working with Tunisia’s Ministry of Vocational Training and Employment to set up a competitive fund that will encourage the kinds of initiatives that TACT has proposed in the area of skills development, both in offshoring and in other sectors where private industry employers have jobs available that currently cannot be filled for lack of the right skills. The competitive fund would offer a framework, with transparent and systematically applied criteria, for employers to partner with training providers on proposals that use “top-up” training to close the gap between the skills that unemployed youth possess and those they need to qualify for an unfilled job.

Source: Thacker 2012.

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an average increase in arrivals of more than 10 percent a year (figure 8.5), MENA was one of the fastest-growing regions for tourist arrivals, outperforming East Asia and the Pacific (EAP).

Generally speaking, the demand for tourism in developing countries is increasing, and emerging economies in particular are expected to act as engines of growth, boosting international travel. China alone is set to send almost 95 million visitors to other destinations by 2020. The MENA region is a neighbor to one of the most important sources of tourists. Indeed, Europe accounts for around 40 percent of total world tourism. European tourists constituted 64 percent, 83 percent, and 56 percent of Tunisia’s, Morocco’s, and Egypt’s arrivals in 1998. Despite the large share of Europeans in the main tourism destinations in the region, MENA’s share of Europe’s total outbound tourism does not exceed 3 percent. Thus there is still ample potential to attract more European tourists.

The region’s natural and cultural endowments represent enormous opportunities. For centuries the Middle East was the strategic land bridge for the trade routes between Europe and the Orient. It is the spiritual center for three of the world’s major religions—Christianity, Islam, and Judaism. Given the region’s concentration of religious and historic sites, the opportunities for expansion of cultural tourism can hardly be overestimated. But these endowments must be coupled with a higher quality of human resources. In the 2011 Travel and Tourism Competitiveness Report, Arab countries were ranked 88th out of 139 countries, on average, in the subindex on human, cultural, and natural resources.
The contribution of tourism to GDP in the MENA region jumped from $80 billion in 1990 to $232 billion in 2010 and currently represents about 13 percent of regional GDP. By 2021 it could generate an additional 2 million jobs in the region. But recent political instability in popular tourist spots, including Egypt, Tunisia, and Syria, prompted a 13 percent drop in arrivals to North Africa and an 11 percent fall in the Middle East, as shown in figure 8.5. According to the Arab Organization for Tourism, losses exceeded $7 billion in 2011. To accelerate the recovery, the region can look for hidden potential in niche tourism products, with medical tourism among the most promising.

Medical tourism: What opportunities for MENA?

Medical tourism can be defined as the provision of cost-effective private medical care to tourists visiting a country for leisure and medical reasons. Medical tourism emerged in the 1990s, owing to several factors, such as Europe’s aging population, health-care shortages in Western and developing countries, the boom in cosmetic surgery, and gaps in the European health insurance mechanisms. Worldwide, medical tourism revenues have risen from $40 billion in 2004 to an estimated $100 billion in 2012 owing to many of the same factors, coupled with rising income in developing countries. By 2015, according to the latest estimates from various national agencies, Thailand and Singapore expect 1 million patients, and India expects around 800,000 patients, by that time, health tourism is expected to generate more than $2.3 billion in India and $3 billion in Singapore. Benefiting from highly skilled human capital, MENA countries could position themselves in this prosperous market—provided they are willing to undertake a rigorous knowledge-based strategy.

The MENA region can benefit from the high variation in health-care costs around the world. For instance, an aortic valve replacement may cost more than $100,000 in the United States, about $38,000 in Latin America, but only $12,000 in Asia. But low-cost elective procedures offer the greatest potential for growth, as only 9 percent of travelers seek lower costs for medically necessary procedures (Ehrbeck, Guevara, and Mango 2008). The most popular treatments sought abroad, therefore, are not big-ticket procedures such as open-heart surgeries and hip replacements, but high-volume outpatient procedures (cosmetic, dental, orthopedic) and procedures that are not covered by health insurance. The latter are already competitively priced in developing countries (figure 8.6). As patients are exposed to greater financial burdens, developed-country governments try to curb health spending, and health insurers increasingly encourage patients to be treated abroad,7 the medical tourism market is going to increase dramatically.

Jordan is a leading medical tourism destination in the region, along with Dubai and Abu Dhabi (Hazaimeh 2008). In 2007 more than 300,000 patients from 84 countries were treated in Jordan, generating revenues exceeding $1 billion and employing more than 40,000 employees, of whom half work in private health institutions. These countries, and eventually others in the region, could vie to accommodate more Arab patients who are currently treated in Asia or America. In 2006 Singapore received 410,000 foreign patients, nearly half of them from the Middle East,8 even though Jordan, Lebanon, Egypt, and Tunisia appear to offer competitive prices. The countries of the region can also explore new strategies to benefit from the globalization of the health industry and their proximity to the European market.

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7. The health insurer of a major grocery chain based in New England, Hannaford, offers its 27,000 clients the option of having several medical procedures done in Singapore rather than the United States, saving the employee up to $3,000 in co-payments and deductibles.
Structural adjustments in the Western health sector represent opportunities for MENA. According to Ehrbeck, Guevara, and Mango (2008), up to 15 percent of health-care sector jobs in high-income countries could be outsourced. Most outsourcing would be done domestically, but some developing countries could capture part of the market. In this sense, the case of the Philippines is interesting, where exports of medical transcription services grew at a fast rate in the early 2000s. Further, the shortage of nurses in Europe forces countries to hire foreign nurses and doctors.

The health sector can create more jobs. In Tunisia it is estimated that export of medical services created more than 10,000 jobs—half of them in the health sector (Lautier 2008). In addition, job growth in the health sector outpaced overall job growth, growing between 1998 and 2008 by 72 percent and 2.9 percent, respectively. Although the proportion of workers in the health sector increased from 1.5 percent in 1998 to 2.5 percent in 2008, opportunities for job creation remain, since medical and supporting functions employ on average 10 percent of the workforce in developed countries. Employment opportunities in the health sector can be enhanced by accelerating trade and private investment in medical tourism.

Promoting health tourism in MENA

MENA countries that enjoy a comparative advantage in health services need to carefully assess their resources and strategies in the face of the current critical deficit of health workers in European countries and elsewhere, coupled with skill shortages (for example, in Africa), waiting lists for certain operations, the continuing boom in cosmetic surgery, and gaps in health-insurance mechanisms and deterioration in the level of reimbursement (particularly for dentistry). Potential niches could include the dental and prosthesis market, the market in comfort surgery and wellness for French speakers, and retirement and residential programs. Trade can be promoted by improving hospitality, with excellent medical treatment combined with cultural and tourist activities.

Health facilities must be certified and meet international quality standards. The absence of a world database on the safety and quality of care has increased the importance of hospitals adopting international voluntary standards. The Joint International Commission has accredited more than 120 hospitals outside the United States, and several other organizations (for example, the International Society for Quality in Health Care, the National Committee for Quality Assurance, the International Organization for Standardization, and the European Society for Quality in Healthcare) have taken steps to ensure that medical travelers receive the highest-quality care. Yet, to date, only 5 of 70 Tunisian clinics are ISO certified.

To facilitate trade, countries should initiate a regulatory audit of the health sector. Governments need to reassess their health-care regulatory regime in light of their domestic health goals and their foreign trade objectives. The review should include rules pertaining to the legal form of health-care institutions, foreign investment, nationality and residency requirements, movement of health personnel, and so on. To take one example, Tunisia’s public and private health services have responded to the increasing role of the private sector through targeted incentives, such as international health-insurance reimbursement agreements that allow the National Health Insurance Fund to contract with private providers. In the same context, the Malaysian government has increased the allowed stay under a medical visa from 30 days to 6 months.

Export promotion strategies in the health sector have to be developed by the private and public sector. Trade promotion is necessary to gain market share abroad. Although the development of trade strategy is foremost the responsibility of the private sector, government also has a major role to play. Indeed, it is critical that the ministries of health, trade, tourism, and foreign affairs coordinate their actions. Experience shows that the best-performing countries, such as Thailand, have created horizontal administrative structures to coordinate domestic positions and strategies on health tourism. In the case of Cuba, a trade promotion agency for health tourism has proven to be very successful. In the Maghreb, by contrast, the current dispersion of actors remains a technical challenge.

Bilateral and regional agreements are necessary to promote trade in the health sector. Bilateral and regional agreements are critical to remove obstacles to trade and to harmonize domestic rules across the region. First, countries must establish conventions with health-insurance providers, as Cuba did with countries in Latin America. Second, bilateral labor agreements must be encouraged, as in the United Kingdom, where Indian and Philippine nurses are allowed to work. Moreover, conventions on education and training of medical personnel that encourage cross-border movement must be strengthened.

Creative industries: Leveraging unexploited opportunities

The Creative Economy Report (UNCTAD 2008) defines creative industries as being “the cycles of creation, production, and distribution of goods and services that use creativity and intellectual capital as primary inputs. They constitute a set of knowledge-based activities, focused on but not limited to arts, potentially generating revenues from trade and intellectual property rights.” Creative industries comprise artwork, media (including books, films, television, and radio), fashion, software, video games, and creative services—architectural, advertising, cultural and recreational, creative R&D, digital, and related services.

From an economic perspective, exports of creative goods and services increased from $227 billion in 1996 to $424 billion in 2005, accounting for 3.4 percent of overall world trade (UNCTAD 2008). For instance, Egypt’s exports of creative services increased six-fold between 1996 and 2005 to reach $102 million, while imports did not exceed $22 million. Creative industries are a labor- and skill-intensive sector offering job opportunities to educated people. Creative industries employ 11 percent of the work force in the Philippines and Mexico, 8.5 percent in the United States, 7.3 percent in Russia, and about 5.5 percent in Canada and Singapore.
In addition, creative industries contribute significantly to GDP, especially in developed countries. According to the World Intellectual Property Organization (WIPO 2012), the contribution to GDP of industries that generate products subject to copyright is around 11 percent in the United States, 8.6 percent in the Republic of Korea, and 5 percent in Latvia and Kenya. Compared to other countries at similar levels of development, creative industries in MENA fail to contribute substantially to GDP. Lebanon is the best-performing country in the region (4.75 percent of total GDP); Jordan, Morocco, and Tunisia lag behind at less than 1 percent (figure 8.7). Although data collection is problematic in the region and does not allow a detailed analysis, it is recognized that MENA countries could significantly increase the contribution of creative industries to their GDP.

One of the most dynamic segments of the creative economy in the MENA region, and one with substantial job-creation potential, is media and entertainment. The region’s traditional print and broadcast media have a long tradition of producing high-quality Arabic language content, and the recent proliferation of pan-Arab, free-to-air satellite TV stations confirms that there is no shortage of Arabic television news. With the emergence of new technologies (Internet, mobile television, music on demand), MENA can move from traditional to digital media.

The media and entertainment market in MENA is one of the fastest-growing sectors in the region. According to PricewaterhouseCoopers (2009), that sector is expected to grow from $17 billion in 2010 to $36 billion by 2015, representing an impressive compound annual growth rate of 13 percent. High revenues in the sector are expected, as spending by end users increases from $3.8 billion in 2006 to $5.2 billion in 2015. Internet access is growing by 25 percent a year, and advertising spending is going up by 7 percent annually. The very positive economic outlook for the media and entertainment sector helps attract new investments and create jobs in the region.

But the MENA region risks being relegated to the lowest value-adding stage of the creative economy. For the past 10 years, the creative market has become more and more global, and access by MENA countries to the global creative economy has been limited. Indeed, MENA currently plays a marginal role in the creative economy owing to several factors, including lack of investment, insufficient entrepreneurial skills, inadequate infrastructure, and the absence of political will. Despite those shortcomings, many opportunities for value creation, employment expansion, technological upgrading, and market development could materialize if appropriate knowledge-based strategies were implemented.

A sound legal framework is needed for the creative industry. Tax authorities should develop, in collaboration with stakeholders, a framework suitable for creative industries, one that would promote rather than discourage investment. For example, Lebanon offers tax exemptions of two to ten years for any investment larger than $200,000. Second, labor laws and regulations must be reviewed to facilitate employment in the copyright-based industry, whose activity is characterized by a high degree of seasonality. Finally, countries should endorse international agreements and treaties on intellectual property rights and translate them into national laws. Strengthening law enforcement and publicizing court decisions on infringement are important factors in enhancing public awareness.

Qualifications need to be strengthened all along the value chain. The success of the creative industry rests on the qualifications of its workforce. Therefore, educational, administrative, and technical qualifications should be improved to enhance productivity and increase the number of start-up companies. First, educational curricula should be reformed to better suit market needs. Second, vocational and technical education should be better linked with the creative economy. Third, the participation of women in the industry should be strengthened, as women in the region represent a pool of untapped talents and resources.

Investments in the media and entertainment sector are needed to add value along the value chain. Technology represents an enabling factor along the value chain; therefore, investments in physical technology assets (backbone networks, access networks, and internet access) and soft technical skills are critical. For instance, to address capacity issues in the region, Abu Dhabi launched the region’s latest media zone, dubbed “TwoFour54,” which provides an international environment for media content in the Arab world. The 200,000 square meters (m²) media zone houses production facilities and provides training and infrastructure for a variety of media sectors, including film, broadcast, digital, gaming, publishing, and music. The rapid change of technology through the provision of online services also requires sizable investments in electronic commerce.

The green economy in developing countries is no longer a matter of luxury. Any knowledge-based development strategy that misses this important pillar will eventually be “self-defeating, as environmental degradation reduces productivity and welfare” (Bowen 2012). But the 2012 Med Report (CMI 2012) has shown the possibility of surmounting the trade-offs...
between economic growth and environmental efficiency to achieve the more-efficient use of natural resources.

**The costs of skipping the green growth agenda are high.** The World Bank (METAP 2008) estimates the costs of environmental degradation by quantifying the detrimental impacts on health of unsafe water and urban air pollution, the cost of natural resource degradation (forest degradation, soil erosion), and the loss of tourism. These costs are equivalent to 2–5 percent of Arab countries’ annual GDP, compared with 1–2 percent of GDP in the Organisation for Economic Co-operation and Development (OECD) countries and 4.5 percent, 3.3 percent, and 8 percent of GDP in India, Mexico, and China, respectively. In the Arab countries, environmental affairs receive no more than 1 percent of the budget.

The Arab region is among those in which water is scarcest, and it is predicted that, with the exception of Egypt, Sudan, Iraq, Lebanon, and Syria, Arab countries will experience severe water stress by 2025 (AFED 2008). Indeed, Arab countries have the second-lowest rate of access to improved water (only 81.4 percent of the population), besting only Sub-Saharan Africa (59.7 percent), and the second-highest regional carbon dioxide (CO2) emissions per capita (4.4 tons), following Europe and Central Asia (ECA) (7.7 tons). Advances in desalination will play a key role in addressing the region’s water shortages [box 8.3].

**Green growth as a source of net job creation**

In any new economic transformation, job destruction and job creation occur simultaneously, generating a net loss or net gain of jobs within any given period. The net gain or loss changes over time. Net job creation from green growth will occur when the demand for eco-friendly products expands at the expense of demand for preexisting goods and services. Achieving a net gain means aligning environmental policy with economic strategy, obliging policy makers and national leaders to make some tough decisions. Fortunately, in exchange for making those tough decisions, long-term environmental, economic, and employment gains can be expected.

**Green growth can be a source of job creation.** Evidence shows that, under an optimistic scenario, the net effect of carrying out environmental reforms could generate at least 10 percent of the jobs needed to keep unemployment from rising in the future.
Transforming Arab Economies (CMI 2012). The 2012 Med Report estimates the employment effect of encouraging the acquisition of new energy-efficient shells for new buildings by 2030 at around 1.3 million jobs, of which more than 431,400 would come from additional investment in energy-efficient equipment (plumbing, electricity, and heating installation and maintenance). Another study shows that spending $100 billion to "green" just 20 percent of the existing building stock in the Arab countries over the next 10 years—by investing an average of $10,000 per building for retrofitting—would create 4 million jobs. The payback period for energy and water efficiency retrofits ranges between two and seven years, based on the level of subsidy provided (AFED 2011). The productivity of the resources with which the Arab world is endowed (notably energy and, in some countries, water) could easily be increased through a package of reforms, notably targeting current energy subsidies that are regressive and counterproductive. In addition, adopting sound schemes to encourage new green niche industries and green entrepreneurs will be essential for accelerating the creation of green jobs.

**The solar energy example**

**Demand for renewable energy is growing, notably from MENA’s neighbor, Europe.** In 2008 energy from renewable sources was estimated to have contributed 16 percent of gross final energy consumption in the 27 EU member countries, compared with 13.1 percent in 1997. It is expected that by 2020 most of the demand for renewable energy will be met from wind energy, hydropower, biomass, and solar photovoltaic

**FIGURE 8.8**

Sketch of possible infrastructure for a sustainable supply of power from renewable sources to Europe, the Middle East, and North Africa

Source: DESERTEC Foundation.
of unused flat land close to road networks and transmission grids. Under favorable conditions, such as the development of a strong local manufacturing industry, MENA can expect to produce 5 gigawatts (GW) of CSP by 2020, as well as 2 GW of exported components. An investment of $1 million in clean energy is estimated to produce 16.7 jobs, compared with only 5.3 jobs for the same amount spent on fossil fuel industries (PERI and AAM 2009).

Solar energy can foster employment. According to a study commissioned by the World Bank’s Energy Sector Management Assistance Program (ESMAP) (Ernst & Young and others 2011), the development of a solar-energy economy can create a significant number of direct and indirect jobs along the value chain. For instance, if the CSP market grows to over 20 GW by 2025, a cumulated total of 200,000 low-skilled jobs in construction and interconnection labor will be created in Algeria, Egypt, Jordan, Morocco, and Tunisia. Jobs in operation and maintenance can be performed by local employees, adding socioeconomic benefit to the region. In addition, an extra 50,000 new local jobs for components manufacturing could also be created by 2025. Finally, 8,000 high-skill jobs in construction-related services (project management and development) could provide opportunities for young graduates.

In addition, solar energy can increase productivity. Added value from products locally manufactured for the solar-energy industry could represent as much as 56 percent of the value chain (table 8.1). The cumulated direct impact related to construction of new power plants and the spillover along the value chain could reach $45 billion. According to the Ernst & Young study, the economic impact would be strongly related to the size of the CSP market size in MENA, as well as the share of local manufacturing in the overall production process. A stable market and large market demand are therefore critical to influence investment decisions on the local production of CSP components.

The potential for exports of solar components is significant. MENA countries can ultimately become major suppliers and consumers of CSP-generated electricity. The same can be true of exports of CSP components if national decisions to promote CSP technologies are made at an early stage (figure 8.9). The key success factors in the move toward exports are a stable home market, a large and growing world market, price competitiveness, international quality standards, a high level of education among sectoral workers, and the removal of trade barriers within the region and between the region and Europe.

Cooperation with international energy operators will open new business opportunities. Several industrial sectors in MENA have the potential to join the CSP value chain, produce components locally, and export a share of their production. But the research, development, and production of components to be exported will require international cooperation and political will. The success of these industries could be facilitated by the development of joint ventures between large international companies and local firms, and also by the local actions of subsidiaries of international players. In addition, the sustainable development of the industry can be achieved within the next two decades by beginning to enhance the skills of local engineers and technicians today.

National strategies for industrial development are needed. The private sector and governments should set clear strategies to develop CSP plants and strengthen R&D efforts. First, to enhance the innovative capacity of industry, more technology clusters and regional innovation platforms should be created. Second, technical curricula should be revised to ensure that graduates are well equipped with the core competences required by high-tech employers. For instance, universities should be encouraged to teach CSP-technology-based courses, particularly to students in relevant technical and engineering fields. In addition, training programs for local manufacturing firms need to be developed to help them overcome innovation barriers and to gain access to the latest technological advances.

Business models should follow comparative advantages. Joint ventures and licensing are the most relevant business model for strengthening international cooperation. Because the production of high-quality mounting structures and the adaption of techniques for coating and bending mirrors are critical to further develop the industry, investments should be made in new production lines based on automated processes for the production of CSP components.
CSP investment opportunities should be widely publicized. Local firms need to know about the potential to invest in the production of solar components and will need technical feasibility studies on production lines. A new regional association specializing in CSP or renewable energy association could be useful in informing potential producers and investors about issues such as CSP market development, manufacturing options, and the latest technological advances in this growing market.

Conclusion

Various factors determine the growth path that the sectors discussed in this chapter should undertake to make the most of existing and foreseeable niches. The region needs to leverage efforts to expand niches and capitalize on comparative advantages. It has clear opportunities to benefit from the restructuring of the global production chain, notably in the Maghreb and Mashreq regions. Niche opportunities are available in many segments of the value chain. The best way to implement the necessary changes may be to start with a number of pilot programs (on a local, national, or even regional level) to act as catalysts and to gain quick wins that could attract more investment, more demand for change, and other positive side effects.

References and bibliography


Spatial diversification complements sector diversification. In fact, the two often go hand in hand. Innovation germinates and grows where there is an accumulation of talent, knowledge, and entrepreneurship: hence those emblematic sites such as Silicon Valley in California or Cambridge in the United Kingdom. Governments in many countries have identified the importance of such places for innovation and job creation, and their promotion has become an essential piece of innovation policies. Arab countries have followed the trend, and since the early 2000s technology parks have spread throughout the region, complemented by the development of brand new cities in resource-rich countries. There has been a proliferation of special economic zones (SEZs) as well, established to attract foreign industries and build export capabilities. In recent years, and notably in the wake of the Arab Spring, governments are also concerned with reducing regional disparities within their borders.

Regional development policies in the Arab world have been centrally driven, since there is a poor tradition of decentralization in the region (see chapter 4). The failure to engage local communities in development planning has negatively affected their design and implementation.

The situation has been evolving in some countries. Among the resource-poor countries, Morocco has developed the most articulated policy to date. A strong regional planning policy adopted in the mid-2000s has included a well-coordinated approach to planning and implementation through regional investment centers (centres régionaux d’investissement) and special export zones and technology parks. Investments are keyed to sector plans designed to boost a set of industries in which Morocco aims to become a global player. These measures are complemented by a major national initiative for human development launched in the mid-2000s to mobilize communities in marginalized urban and rural areas. In 2011 the king, in response to aspirations for democratization and participation expressed in the wake of the Arab Spring, launched an important regionalization reform. Elsewhere in the region, Dubai and Qatar have undertaken spectacular initiatives to become global innovation hot spots, while Saudi Arabia has begun building entirely new cities devoted to specific purposes, as described in box 9.1.

In this chapter, local and regional development issues and policies in the Arab world are analyzed at three levels: (i) innovative sites within cities or localities, (ii) cities, and (iii) regions. The issues to be considered are not the same from level to level. At the site level, the question is how to build innovative places from scratch; at the city level, the question is how to make cities—new or existing—drivers of innovation for the country as a whole; at the regional level, the question is how to reduce economic and social disparities from one region to another and among the localities within a given region. In all cases, however, there is a need for a holistic approach, in which issues related to each of the four knowledge economy pillars should be addressed. Creating and maintaining a hospitable climate for innovation and development depends on systemic action.
The jobs that SEZs and free zones do create come at relatively low cost, thanks to FDI, but in most cases there is little or no technology transfer and few spin-offs to the surrounding areas. For these reasons, it is important to encourage collaborative and linkage projects between investment projects in the zones and firms, research bodies, and educational institutions in the local economy. Location is crucial, as the zone must be close to good infrastructure (such as roads, railways, and ports) to minimize costs that otherwise might have to be borne by public authorities. The need for proximity to infrastructure may have to be balanced against the equally important goal of avoiding greater pressure on already congested urban areas.

A growing number of technoparks

Technoparks, developed by governments with large investments of public funds, are considered to be the quintessential innovation sites. About 50 technoparks operate in the Arab region (appendix 1). Some are clear successes, in terms of their contribution to the innovative dynamism of their country or the number of jobs they have created. Global experience suggests that it takes about a decade for a technopark to reach a significant size (1,000 employees at minimum). Examples are...
the El Gazala Technopole in Tunisia, launched in 2003, which focuses on information and communication technology (ICT), hosts about 100 firms, and employs about 2,000 people—70 percent of whom have a master’s-level engineering degree or the equivalent (figure 9.1). The Casa Technopark, in Morocco, has a similar profile. The Tunisian government has laid plans to build some 10 so-called technopoles throughout the country, each focused on a specific sector or area of technology and linked to identified strengths and advantages of the localities where they will be situated. Supported by the European Investment Bank (EIB), the program has suffered some delays owing to slow bureaucratic decision making and battles among the responsible ministries. Morocco also plans to expand its technopark program to include a series of agripoles that will exploit opportunities for agro-industrial clusters such as Agadir, discussed further on.

The success of a technopark depends on a few key factors:

- The presence within the park of solid educational infrastructure, such as technological universities and management institutes.
- Efficient incubating structures linked to active financial networks and business angels to support would-be innovators and entrepreneurs.
- Adequate transport and logistics infrastructure, including, ideally, the proximity of an international airport.
- Above all, good governance conditions. From this viewpoint, technoparks that are managed exclusively by government authorities, whether they are national or subnational, are doomed to fail. Other key actors, including the business sector, foreign investors, and academic circles must be involved, and all must operate under transparent and clear rules of the game, especially with respect to resource allocations [EIB, Medibtikar, and Ville de Marseille 2010].

Berytech, located in Beirut, Lebanon, combines these elements to produce an interesting success story (box 9.2).

Few industrial clusters have formed in the Arab world. They coalesce more gradually than do technoparks, which are directly structured and supported by governments. One of the most successful clusters is located in Agadir in southern Morocco, which is built around agrifood industries and fisheries. Key factors for success include: a continuous process of upgrading and modernizing equipment; comprehensive quality control; an industrial organization that favors informal and social relations that build trust and cooperation (notably through cooperatives that have tackled joint issues such as insurance and EU quotas); and an active role for intermediate associations, local authorities, and chambers of commerce. These “soft” organizational elements can be stimulated by governments (usually indirectly, through appropriate incentives), but they take time to form and, more fundamentally, require strong local participation. The evolution in several Arab countries toward granting more power to local and regional authorities should facilitate the process of clustering.

Figure 9.1 El Gazala technopole, Tunisia

a. Number of employees in El Gazala, 2002–10

<table>
<thead>
<tr>
<th>Year</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>517</td>
</tr>
<tr>
<td>2003</td>
<td>700</td>
</tr>
<tr>
<td>2004</td>
<td>750</td>
</tr>
<tr>
<td>2005</td>
<td>850</td>
</tr>
<tr>
<td>2006</td>
<td>1,200</td>
</tr>
<tr>
<td>2007</td>
<td>1,318</td>
</tr>
<tr>
<td>2008</td>
<td>1,500</td>
</tr>
<tr>
<td>2009</td>
<td>1,754</td>
</tr>
<tr>
<td>2010</td>
<td>1,800</td>
</tr>
</tbody>
</table>

b. Distribution of employees in El Gazala, 2010

- Engineers 72%
- Managers 10%
- Technicians 13%
- Others 5%

Source: El Gazala Technopark, CMI Survey 2012.

3. El Gazala, Tunis (ICT), Sidi Thabet (biotechnology), Bizerte (agrifood), Sousse (electronics, mechanics, and ICT), Monastir El Fejja (textiles), Sfax (multimedia and communication), Borj Cedria (environment and plant biotechnology), Mednine and Jendouba (exploitation and commercialization of the natural resources of the Sahara), and Gafsa (phosphate mining).

4. The high potential of the Agadir cluster is demonstrated by its large share of the country’s agricultural production: 48 percent of citrus fruits, 21 percent of truck farming, 43 percent of dates, 70 percent of argan, 95 percent of saffron, 55 percent of almonds, and 100 percent of roses.
Agripoles as sources of rural development. Except in Tunisia, technoparks and clusters remain largely concentrated around large cities. If successful, the development of agripoles in those regions with agrifood potential would help promote regional diversification, thereby reducing the pressure on already overcrowded cities. The development of agripoles depends, however, on the existence of a receptive milieu of farmers and trade and business partners, as well as of a broader national plan that integrates trade, training, research and development (R&D), infrastructure development (roads), and policies to develop farmers’ cooperatives. Morocco’s Plan Vert is an example of such a plan.

Developing competitive and sustainable cities

Global innovation hot spots and new cities in the Gulf

Having observed the success of technoparks and clusters, some countries with abundant resources have launched large-scale programs to build new cities devoted to knowledge and innovation as showcases for the entire region, if not the world. Dubai pioneered the approach. It was inspired by the example of Singapore, which evolved in a few decades from a poor warehouse island to a hub for manufacturing and then for global trade, finance, and education by attracting multinational companies to its hospitable business environment. Dubai began by developing a world-class port and airport, before investing in a series of dedicated free zones and technoparks specializing in information technology (IT), media, health, biotechnology, and, more recently, financial services (table 9.2).

After a brilliant take-off, the ambitious Dubai operation has been only moderately successful, to the extent that it has not led, so far, to a full-fledged, sustainable, and indigenous innovation process. The reasons seem to lie in the lack of social capital and the failure of people and organizations operating in the newly developed areas to coalesce into dynamic clusters (Ewers 2007). At the same time, speculative real estate

**TABLE 9.2 Knowledge and technology sites in Dubai**

<table>
<thead>
<tr>
<th>Name</th>
<th>Year founded</th>
<th>Area (km²)</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jebell Ali</td>
<td>1985</td>
<td>100</td>
<td>Trade</td>
</tr>
<tr>
<td>Dubai Airport Free Zone</td>
<td>1996</td>
<td>12</td>
<td>Trade</td>
</tr>
<tr>
<td>Dubai Internet City</td>
<td>2000</td>
<td>4</td>
<td>Information technology</td>
</tr>
<tr>
<td>Dubai Technology Park</td>
<td>2003</td>
<td>3</td>
<td>Petrochemicals</td>
</tr>
<tr>
<td>Knowledge Village</td>
<td>2003</td>
<td>21</td>
<td>Healthcare</td>
</tr>
<tr>
<td>Dubai Industrial City</td>
<td>2004</td>
<td>52</td>
<td>Manufacturing</td>
</tr>
<tr>
<td>Dubai Financial City</td>
<td>2004</td>
<td>44</td>
<td>Finance</td>
</tr>
<tr>
<td>Dubai Tech</td>
<td>2006</td>
<td>2.3</td>
<td>Biotech</td>
</tr>
<tr>
<td>Dubai Silicon Oasis</td>
<td>2007</td>
<td>7</td>
<td>Information technology</td>
</tr>
</tbody>
</table>

Source: Ewers 2012.

BOX 9.2 The Berytech technology park and fund

In Lebanon the Berytech technology park, initiated by the private University of Saint Joseph, is a multisector park focusing on services: advertising, business coaching, accounting, management consulting, computer hardware and peripherals, and clinical research. In exchange for equity ownership, Berytech’s seed capital fund stimulates high-tech growth by investing in early-stage Lebanese technology companies, providing both equity capital and the guidance needed to succeed. The fund invests from $100,000 to $1.2 million in any single operation, a range not generally considered by formal venture capital funds, and helps to secure additional financing if and when needed. Focus sectors include ICT, energy, food processing, environment, health care and medicine, and media and communications.

Similar in spirit is the Beirut Emerging Technology Zone (BETZ) currently under development by the Investment Development Authority of Lebanon in cooperation with the Municipality of Damour. It is expected that BETZ will include among its facilities an incubator for start-ups in ICT and other new technologies.

Finally, the LIRA program aims at building effective cooperation among industry, academia, and research centers to address the research and development needs of Lebanese industry.


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5. Morocco has one fully operational agripole in Meknes and two partially operational ones in Berkane and Agadir. The plan is to create at least four more in the coming years. These poles are expected to generate additional sales of €361 million and create 16,000 new jobs (Ciheam 2009).
investments led to major problems, which were amplified by the global financial and economic crisis that began in 2008.

In the late 1970s Saudi Arabia embarked on an ambitious program to build two industrial cities dedicated to the oil industry. Jubail and Yambu failed to create the expected employment, although a competitive petrochemical industry developed in the country. A major issue was the transfer of knowledge and technology to national enterprises and the labor force. Saudi Arabia has now launched an even more ambitious program to build four new cities, including a so-called knowledge city in the town of al-Madina [see box 9.1]. The success of such initiatives depends on a series of factors, including good leadership, the existence of a comprehensive policy framework with actionable steps and clear indicators to monitor progress, world-class universities and research centers, and efficient networking institutions capable of bringing different actors together.6

Modernization of Mediterranean cities

Long before the establishment of nation-states, cities flourished all around the Mediterranean. In the modern era they continue to be the dynamo of the economic and political life of the region. A variety of pressures and new dynamics—an increased population, environmental degradation, economic restructuring—have led governments in the Maghreb and Mashreq to launch sizeable operations to modernize cities and their surroundings, with the cooperation of local authorities. Among numerous examples, one may cite the renovation of traditional city centers (medinas, as in Essaouira and Meknes, Morocco), the modernization of urban transport systems (as in Rabat and Tunis), the building of ports (Tangiers), the construction of large waste-management facilities (Alexandria), and the rehabilitation of slums (Beirut and Damascus), in addition to the building of technopoles and industrial zones, as described previously.

These operations have benefited from the financial and technical support of the international community (World Bank, European Investment Bank [EIB], Agence Française de Développement [AFD], the Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ], and others). On occasion, they have led to a rethinking of entire agglomerations, through the development of structured urban strategies, as in Sfax (Tunisia) and Amman (Jordan). Following a World Bank study of four North African coastal cities (Alexandria, Tunis, Casablanca, and the Bouregreg Valley in Morocco), a similar study is being launched in Algiers. The possibility of replicating the study in Amman is under discussion with the municipality of Greater Amman.

Throughout the world, cooperation between subnational entities—city to city or province to province—has taken on growing importance in recent decades. For example, the global ART GOLD (Governance and Local Development) program of the United Nations Development Programme (UNDP), and its subregional components, is based on instruments for local development and “decentralized cooperation,” a term coined to describe cooperation between subnational entities. Key goals are to enhance the participation of local authorities and engage social actors from both the South and the North. The program offers technical assistance to stakeholders working on local development and governance issues, harmonizing the efforts of international, national, and local actors.

This overall movement has spread to the Mediterranean and materialized in the form of initiatives led by nongovernmental organizations (NGOs) working with local authorities. These organizations provide expertise and technical assistance for capacity building, but rarely financial aid. Among the many domains covered by such cooperative projects are those related to the knowledge economy: governance [through mechanisms for the empowerment of local authorities], innovation [through support to help small- and medium-sized enterprises (SMEs) develop new activities], education [through the provision of teaching materials and even teachers’ exchanges], and ICT (Djeffal 2012).

The urban development programs of the Center for Mediterranean Integration (CMI) are supporting and complementing these efforts and initiatives by involving various CMI partners. Some examples are given below.7

- Urban development strategies are implemented in cooperation with the Med Cities network, notably for the city of Sfax.
- Land management reviews are being conducted in Tunisia and Lebanon.
- Following a World Bank study of four North African coastal cities (Alexandria, Tunis, Casablanca, and the Bouregreg Valley in Morocco), a similar study is being launched in Algiers. The possibility of replicating the study in Amman is under discussion with the municipality of Greater Amman.
- On the topic of urban transport, three conference reports are being finalized: (i) a best practices guidebook; (ii) a study of urban transport in medinas and historic city centers; and (iii) a distillation of lessons learned in the Mediterranean about the suitability of various modes of mass transport.
- In the field of ICT, a UNDP-led program that provides for exchanges of experience between Mediterranean cities has produced a guide to ICT use for local authorities (CMI and UNDP 2012). The program has also undertaken pilot projects, including a geoinformation system for street addressing tested in the city of Tripoli (Lebanon).
- The CoMun Network led by Germany’s GIZ aims at strengthening municipal structures through a learning network that shares cross-border experience on key municipal and urban development issues among cities in Morocco, Tunisia, and Algeria. The program is active in the areas of waste and transport management, rehabilitation of medinas, and energy efficiency.

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6. As noted in the report of the conference on Knowledge Cities held in al-Madina, Saudi Arabia, March 2011.
7. For more details on CMI urban development programs, see http://www.crimarseille.org/Urban-Spatial-Development.php.
An urban finance initiative sponsored by the Union for the Mediterranean and co-led by the EIB and the AFD aims to identify and implement about 15 sustainable and innovative urban development projects. The initiative provides grants for technical assistance to accelerate the implementation of the projects. The World Bank, Germany’s KfW Group, and the European Bank for Reconstruction and Development (EBRD) may join the initiative.

CMI and Cities Alliance members active in the Middle East and North Africa (MENA) region have decided to form a partnership that will include cities and governments in the region. The partnership will offer support for the development of urban development strategies through the MENA Joint Work Program, which is collectively managed and administered by Cities Alliance and the CMI.

Reducing regional disparities

Living standards differ markedly between rural and urban areas in the MENA region, as revealed by indicators of access to water and sanitation (table 9.3). Location has a greater effect on household welfare in some countries than in others. The spatial component of inequality is greatest in Morocco, followed, in order, by Egypt, Yemen, and Syria. It is much less marked in Jordan (World Bank 2010). Nevertheless, in no MENA country does rural-urban inequality account for more than a fifth of total inequality of household expenditure. Overall, MENA’s urban-rural and interprovincial divides are no greater than those in other developing regions of the world.

The dynamics of regional disparities are complex, as illustrated by Egypt. Variations in gross domestic product (GDP) per capita are not directly linked to population increases or decreases. For example, the South Sinai and Red Sea governorates had the two steepest population increases between 2003 and 2009 (probably owing to the boom in tourism); however, they had higher growth in GDP per capita than other governorates where population growth was lower. The cause appears to be agricultural trends: increases in cultivated area explain more than 22 percent of the increase in the GDP per capita.

The recent growth in GDP per capita in Upper Egypt pushed the region’s Human Development Index (HDI) up by 0.247 between 2008 and 2010, exceeding the increase that occurred in the governorates of Lower Egypt (0.206). Nevertheless, the HDI remains low in Upper Egypt, and poverty remains highly concentrated, notably in rural areas. For every 10 poor persons in Egypt, 8 live in a rural area, 7 live in Upper Egypt, 3 work in agriculture, 3 are illiterate, and 3 have basic or secondary education; most important, 4 live in households with more than 3 children (UNICEF 2010).

### TABLE 9.3 Regional disparities in select Arab countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Indicator</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>Population growth</td>
<td>-0.42</td>
<td>2.43</td>
</tr>
<tr>
<td></td>
<td>Water source</td>
<td>79</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>Sanitation</td>
<td>88</td>
<td>98</td>
</tr>
<tr>
<td>Egypt</td>
<td>Population growth</td>
<td>1.67</td>
<td>1.84</td>
</tr>
<tr>
<td></td>
<td>Water source</td>
<td>99</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Sanitation</td>
<td>93</td>
<td>97</td>
</tr>
<tr>
<td>Jordan</td>
<td>Population growth</td>
<td>2.02</td>
<td>2.25</td>
</tr>
<tr>
<td></td>
<td>Water source</td>
<td>92</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Sanitation</td>
<td>98</td>
<td>98</td>
</tr>
<tr>
<td>Morocco</td>
<td>Population growth</td>
<td>0.21</td>
<td>1.60</td>
</tr>
<tr>
<td></td>
<td>Water source</td>
<td>61</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Sanitation</td>
<td>52</td>
<td>83</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Population growth</td>
<td>-0.17</td>
<td>1.64</td>
</tr>
<tr>
<td></td>
<td>Water source (2009)</td>
<td>84</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>Sanitation (2009)</td>
<td>64</td>
<td>96</td>
</tr>
<tr>
<td>Lebanon</td>
<td>Population growth</td>
<td>-0.20</td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>Water source</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Sanitation</td>
<td>87a</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation based on most recent data from WDI.
Note: a. 2005 data.

A World Bank study on spatial disparities in the MENA region [World Bank 2010] recommends policy in three areas:

**First, level the playing field and invest in people.** This must be a cornerstone of any policy response. MENA’s political and colonial history—characterized by strong central bureaucracies, centralized economic and fiscal policies, and weak accountability relationships—has resulted in a general neglect of some regions. To create a level playing field for development, the challenge is to address the historical disadvantages of populations on the periphery. Improving living standards in lagging regions is therefore as much a question of developing people as it is of developing places. Developing people means actions that promote education, empowerment, and participation.

**Second, strengthen connectivity and build linkages between wealthier areas and those that are economically disadvantaged.** MENA’s lagging areas have an advantage: 61 percent of their population lives within three hours of a major city. MENA can connect its lagging areas to agglomerating hubs by investing in transport, trade facilitation, and ICT.

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8. The HDI is a comparative measure of life expectancy, literacy, education, and standards of living of a country.
Third, facilitate cluster development in areas with unrealized potential, not by throwing large amounts of money and infrastructure at the problem, but by supporting local actors and helping to coordinate their initiatives [see the previous discussion of the Agadir cluster]. This includes making space for public-private partnerships (PPPs), investing in human capital and related infrastructure, and understanding what initiatives the regions can support rather than trying to force investment with subsidies and tax breaks.

There are, in more than one country, considerable opportunities in agriculture that could be exploited through fine-tuned policies to promote the use of new technologies, the development of trade and commercial channels, and, above all, the establishment of training programs, especially for women. The case of argan oil in southern Morocco (box 9.3) illustrates the challenges to be faced, as well as the crucial importance of rural development for staunching poverty and slowing the exodus toward urban areas.

The right policies trump geography. To sum up the key message of this report, one may simply say that although the concentration of economic activity in certain areas may be an inevitable consequence of growth, governments have it in their power to mitigate spatial disparities through careful analysis and appropriate policies, carefully adapted to local circumstances.

BOX 9.3 Exploiting argan oil in Morocco

Argan oil is pressed from nuts in the fruit of argan trees. It has long been used by the Berbers for cooking and cosmetics. Although still used for these purposes, it is now one of the most expensive oils in the world—a valuable crop indeed, especially for the manufacture of cosmetics. The argan forest region of Morocco, declared a United Nations Educational, Scientific and Cultural Organization (UNESCO) Biosphere Reserve in 1998, represents 14.25 percent of the country’s forest land. Argan exploitation has saved some 3 million jobs, including 2.2 million in rural areas [Charouf 2006]. This means that the argan oil industry ensures jobs for about half of the labor force in Morocco’s rural areas and has the potential to shrink rural-urban migration in Morocco, eradicating poverty in the process and creating job opportunities for women [who generally require training to make them comfortable with the administrative and financial responsibilities they assume when they participate in argan cultivation]. The argan tree also has an ecological role. It is the second-most-important cover for Moroccan land, and its deep roots are an important barrier to desertification.

Although argan oil has enjoyed a boom since the late 1990s, argan cultivation is facing major challenges, owing to shrinkages in the area covered and in the density of coverage. In 50 years density has fallen from 100 trees per hectare to 30 because of increases in population and livestock grazing. Decision makers are confronted with tough choices between traditional and modern production methods, which have crucial consequences for the concerned populations.

There are two methods of extraction: traditional hand pressing and modern mechanical pressing. Both methods generate income and thus incentives to conserve existing trees and to establish new plantations. But the production of mechanically pressed oil transfers jobs and profit to urban areas, leaving rural regions with nut production alone. Measures to promote hand-pressed oil production contribute more directly to reducing poverty and stem the rural exodus. But producing argan oil the traditional way takes longer, and the production process is less hygienic, reducing the value of the product for cosmetic purposes. Moreover, commercialization strategies and logistics of rural women’s cooperatives are poor. A liter of traditionally produced argan oil costs about 120 Dhs, 85 of which go directly to the women. With mechanical extraction, the price of a liter can exceed 300 Dhs [FAO 2006], and rural women who gather the argan tree’s fruit actually receive less than they do from traditional production.

The best way to resolve the dilemma between the traditional and modern production methods is to maximize profits and long-term social benefits simultaneously. This could be done by offering better training for women in the use of basic machines and in the bottling of the oil, and through a program to preserve the argan biosphere. The branding and commercialization of traditional argan oil is an essential step toward deriving higher and fairer profits in international markets. Such “semi-technological” production mechanisms would help empower women in rural Morocco, eradicate poverty, and reduce urbanization.

Source: Taha 2010.
Conclusion

Innovative sites are an important component of the knowledge economy in all countries. But they are even more crucial in the Arab world in view of its unique geography, where large desert spaces promote urban concentration. Whatever the size of the sites considered in a local or regional development initiative—technoparks, cities, or broader localities—it is essential to coordinate investment in the four knowledge economy pillars, particularly in the rural regions that need further development and have a great potential to reduce pressure on urban areas. It is equally important to engage local populations and authorities, an imperative that is particularly challenging for Arab societies that have experienced many years of strongly centralized governance. But the promising initiatives undertaken here and there show the way ahead and merit close attention. Support from the international community—including through city-to-city cooperation—will be important for capacity building and economic development.

References and bibliography


EIB (European Investment Bank), World Bank, Medibtikar, and Ville de Marseille. 2010. Plan and Manage a Science Park in the Mediterranean: Guidebook for Decision Makers. Luxembourg: EIB.


## Appendix 9.1 Technopoles in the Arab world

<table>
<thead>
<tr>
<th>Country</th>
<th>Type</th>
<th>Name of the structure</th>
<th>Sector</th>
<th>Status</th>
<th>Size (hectares, except as otherwise noted)</th>
<th>Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALGERIA</td>
<td>Science park</td>
<td>Sidi Abdallah (including 4 technology parks)</td>
<td>ICT</td>
<td>Operational</td>
<td>1,870</td>
<td></td>
</tr>
<tr>
<td>ALGERIA</td>
<td>Technology park</td>
<td>Technopark El Boustène</td>
<td>ICT, electronics, biotechnology (pharmaceuticals).</td>
<td>Under development</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>ALGERIA</td>
<td>Technology park</td>
<td>Ibnou-Sina</td>
<td>Biotechnology (pharmaceuticals), health care and medicine, ICT, tourism, engineering.</td>
<td>Under development</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>ALGERIA</td>
<td>Technology park</td>
<td>Cyber Park</td>
<td>ICT, media, and communications.</td>
<td>Under development</td>
<td>94</td>
<td>400 (already created) with the objective of creating 2,400.</td>
</tr>
<tr>
<td>ALGERIA</td>
<td>Technology park</td>
<td>Park of Sidi Bennour</td>
<td>Agrifood</td>
<td></td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>BAHRAIN</td>
<td>Technology park</td>
<td>Bahrain Technology Park</td>
<td>ICT, health care, and medicine.</td>
<td>Under development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAHRAIN</td>
<td>Technology park</td>
<td>iTeknoCity</td>
<td>ICT, biotechnology.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EGYPT</td>
<td>Science park</td>
<td>City for Scientific Research and Technology Application</td>
<td>Biotechnology, information technology (informatics research), advanced engineering (new materials), nanotechnology (solar cells).</td>
<td>Operational</td>
<td>250 acres</td>
<td>30,000 (upon completion)</td>
</tr>
<tr>
<td>EGYPT</td>
<td>Technology park</td>
<td>Egypt’s Smart Village</td>
<td>ICT</td>
<td>Operational</td>
<td>300 acres</td>
<td>35,000 (by end of 2010); 100,000 (expected in 2014).</td>
</tr>
<tr>
<td>EGYPT</td>
<td>Science park</td>
<td>Sinai Technology Valley</td>
<td>ICTs, microelectronics, biotechnology, new materials, fine tools, renewable energy.</td>
<td>Under development</td>
<td>72 km²</td>
<td></td>
</tr>
<tr>
<td>EGYPT</td>
<td>Science park</td>
<td>Northern Coast Technology Valley</td>
<td>New technologies.</td>
<td>Under development, still at the study stage (Alexandria)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EGYPT</td>
<td>Contact- centre</td>
<td>Cairo Contacts Centres Park</td>
<td>Call centers and outsourcing.</td>
<td>Operational</td>
<td>31.08</td>
<td>40,000 direct and 60,00 indirect.</td>
</tr>
<tr>
<td>JORDAN</td>
<td>Technology park</td>
<td>The Hashemite University Technology Park</td>
<td>ICT</td>
<td>Operational</td>
<td>1.5 km²</td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>Type</td>
<td>Name of the structure</td>
<td>Sector</td>
<td>Status</td>
<td>Size (hectares, except as otherwise noted)</td>
<td>Jobs</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------</td>
<td>--------------------------------</td>
<td>-------------------------------------</td>
<td>-----------------------------</td>
<td>-------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>JORDAN</td>
<td>Technology Incubator</td>
<td>Ipark</td>
<td>ICT</td>
<td>Operational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JORDAN</td>
<td>Technology park</td>
<td>CyberCity</td>
<td>Special Free Economic Zone (real estate development and industrial projects), ICT.</td>
<td>Operational</td>
<td>4.5 km²</td>
<td></td>
</tr>
<tr>
<td>KUWAIT</td>
<td>Technology park</td>
<td>Kuwait Technology Park</td>
<td>ICT</td>
<td>Operational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEBANON</td>
<td>Technology park</td>
<td>Berytech</td>
<td>ICT, media and communications, health care and medicine, environment, agrifood (food processing), energy.</td>
<td>Operational</td>
<td>500 (since creation in 2001)</td>
<td></td>
</tr>
<tr>
<td>LEBANON</td>
<td>Business Incubator</td>
<td>BIAT</td>
<td>ICT, others</td>
<td>Operational</td>
<td></td>
<td>45 jobs (215 expected in 2016)</td>
</tr>
<tr>
<td>LEBANON</td>
<td>Science park</td>
<td>Beirut Emerging Technology Zone</td>
<td>Electronics, ICT, biotechnology, media, and communications.</td>
<td>Under construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEBANON</td>
<td>Technology park</td>
<td>Ede Global Village (Jbeil)</td>
<td>ICT</td>
<td>Under construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEBANON</td>
<td>Technology park</td>
<td>Makse Park (Bekaa Valley)</td>
<td>ICT</td>
<td>Under construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOROCCO</td>
<td>Technology park</td>
<td>Casablanca Technopark</td>
<td>ICT</td>
<td>Operational</td>
<td>29,400 m²</td>
<td></td>
</tr>
<tr>
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<td>ICT</td>
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<td>Tan Tan</td>
<td>Agrifood (sea products processing).</td>
<td>Operational</td>
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### Table: Managing Local and Regional Development in Arab Economies

<table>
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<th>Country</th>
<th>Type</th>
<th>Name of the structure</th>
<th>Sector</th>
<th>Status</th>
<th>Size (hectares, except as otherwise noted)</th>
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<td>Partially operational</td>
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<td>ICT</td>
<td>Under construction</td>
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<td>OMAN</td>
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<td>ICT, tourism.</td>
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<td>Sidi Thabet</td>
<td>Biotechnology (pharmaceutics)</td>
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<td>Agrifood</td>
<td>Operational</td>
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<td>TUNISIA</td>
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<td>Sousse</td>
<td>Electronics, mechanics, and ICT</td>
<td>Operational</td>
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<td>TUNISIA</td>
<td>Competitiveness center</td>
<td>Monastir El-Fejja</td>
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<td>Borj Cedria</td>
<td>Renewable energy, water, environment, and plant biotechnology.</td>
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<td>Medenine</td>
<td>Exploitation and commercialization of natural resources of Sahara.</td>
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<td>Gafsa</td>
<td>Mining [phosphate]</td>
<td>Under development</td>
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*Source: Authors’ compilation, CMI Survey 2012.*

*Note: ICT = information and communication technology.*
Knowledge has always been central to development.\(^1\) A thousand years ago the Arab world led the world in knowledge, prosperity, and development. Arab science and technology, as well as free trade and tolerance for all religions, were key to this development. It is time to restore these knowledge-based traditions to the Middle East and North Africa.

Thanks to the development of the Internet and a variety of new information and communication technologies, knowledge is now truly global, accessible, and utterly democratic. With this dramatic technological change has come a globalization of economies, sparking intensified competition and the emergence of more-sophisticated value chains in production processes. The impact of this paradigm shift is felt all around us. We witness economies—relatively small ones such as Finland and Singapore, medium-sized ones such as the Republic of Korea, and large ones such as China and India—that are able to harness the power of technical change, compete in the global economy, and nurture their knowledge workers. Others fail to acquire, adapt, and use new technologies; to upgrade their knowledge capabilities; or to express their creative talents, dooming them to decline or, at best, to dependence on their finite endowments of natural resources.

Across the globe, far-sighted leaders are searching for new ideas and strategies to deal with a changed reality. The Arab Spring has shown that countries can no longer rely on narrow, statist paradigms of growth. In the southern Mediterranean, years of autocratic rule characterized by crony capitalism, growing inequality, and harsh suppression of political freedoms have been rejected by popular movements. The challenge now facing these countries is to put in place a system that is free, just, inclusive, creative, and dynamic. Restoring confidence and improving governance are the needs of the hour, but new governments in the region will also have to deliver growth and jobs—quickly, before disillusioned populations are driven to revolt once again. Although the oil exporters of the region seem to have weathered the storm a little better, their regimes, too, must act quickly to diversify their economies so that they can continue to prosper as their oil wealth dwindles.

Given these immense challenges and opportunities, where should the region’s policy makers focus their attention? What should they do to stimulate growth, create jobs, restore trust, and provide a measure of hope and prosperity for their populations? In this report we have sought to answer some of these questions in an integrative framework. But it is only the beginning of a process. Putting the new model to work in any country requires a vision, a strategy to articulate that vision, the coordination of multiple government actors around that strategy, the engagement of stakeholders in the private sector and civil society, and, in many countries, the involvement of various development partners. The proposed strategy must be adapted to each country’s features, building on their strengths and reducing weaknesses. The key is leadership. Will Arab leaders take up the challenge?

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1. This section draws on an unpublished background report prepared for this project in 2011 by Ismail Radwan, Pierre Strauss, and Simon Bell.
Annexes

- **Annex 1.** Econometric model and literature analysis: The knowledge economy, growth, and employment
- **Annex 2.** Some inspiring country experiences
- **Annex 3.** A country application of the knowledge economy model: A bird’s-eye view of the Arab world
Annex 1
Econometric model and literature analysis:
The knowledge economy, growth, and employment

The growth models pursued in the Middle East and North Africa (MENA) have not delivered enough jobs. Unemployment remains high, especially among young people and women, making it an acute social problem. Many of the unemployed hold a university diploma. Their unemployment reduces the return on education for themselves and the incentive of others to invest in education. The urgency of tackling the unemployment problem in MENA cannot be overstated.1

With the advent of the Arab Spring, the countries of the region are revisiting their growth and development strategies, with reducing unemployment a key objective. In this context, there is strong interest in moving to a knowledge-based, productivity-driven growth model.

MENA is well placed to follow such a strategy. The region is close to one of the world’s major sources of innovation, Europe. Although more progress is needed, the region is now much more open to trade and investment than in the past. Historic investments in education have significantly increased the region’s capacity to absorb new technologies and know-how. And oil wealth provides many countries the means to invest massively in building knowledge-based economies, including information and communication technology (ICT), specialized schools and research centers, and the backbone logistics needed to connect to the global economy.

The effects of investment in knowledge on long-term growth are undisputedly positive, but it remains an open question whether a knowledge-based, productivity-driven growth model can create jobs on the scale required in the MENA region. That question is the focus of this annex, which explores the conceptual links between knowledge and employment, reviews the related empirical literature, and tests econometrically the relationship of knowledge, growth, and employment using a sample of MENA countries.

At the conceptual level, this annex shows that investment in knowledge always pays off in the long run by fueling productivity-driven growth, increasing welfare, and raising the employment of skilled labor. Whether those effects are enough to reduce unemployment, however, depends on a host of factors, chief among them the skill profile of job seekers. At the macroeconomic level, productivity growth enhances competitiveness, firm growth, and, all other things being equal, job creation. Furthermore, technology adoption is less destructive to jobs than is often feared, provided one adopts an economywide perspective. Finally, because investments in knowledge produce direct benefits for skilled labor (versus unskilled, which benefits indirectly), policy remedies, such as facilitating links between skill-intensive and non-skill-intensive sectors, are crucial, in part to avoid or minimize wage inequality across the skills spectrum. These theoretical insights are corroborated by the empirical literature.

Knowledge, growth, and employment: Conceptual links and empirical evidence

Historically, technical change has gone hand in hand with growth in employment and wages. Experiences of the Organisation for Economic Co-operation and Development (OECD) economies show that knowledge-intensive and high-technology sectors tend to be the most dynamic in terms of output and employment growth. Some countries, however, have been experiencing high unemployment and sluggish job growth in periods of rapid technical advance. This raises questions about the adequacy of existing mechanisms for translating innovation and higher productivity growth into more and better jobs.

At the conceptual level, the links between knowledge and employment are often examined at two levels. At the macroeconomic level, the focus is on how investment in knowledge affects long-term growth and, through it, employment. At the micro level, the focus is on how investments in knowledge affect firms’ productivity and technology adoption and, through these channels, their demand for labor.2

The links between knowledge and growth have been studied by authors such as Romer (1993) and Grossman and Helpman

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1. This annex was prepared from Chen, Diop, and Muller (2012). The original paper, available from the authors, contains an extensive review of the literature on the interactions of knowledge, growth, and employment.
2. This section builds on Diop (2010).
Annex 1. Econometric model and literature analysis

(2011), who undertook to explicitly incorporate knowledge into growth models. In the new growth models, investment in knowledge helps generate new ideas and processes that result, sooner or later, in new products and processes. Since the pioneering work of Schumpeter (1912/1961), this has been called innovation.3

Even if some of the rewards of innovation are appropriated through patents or copyrights, new ideas always generate positive externalities that can be captured by individuals, firms, and industries capable of absorbing them.4 In other words, innovation’s benefits for society exceed the private benefit captured by innovators. This means that when entrepreneurs innovate, countries can grow in spite of diminishing returns to capital and labor.5 In today’s global market, innovation is a condition for increasing market shares for many products. About 60 percent of export growth now takes place through new product varieties, rather than through additional exports of the same goods (see, for example, Hummels and Klenow [2005]).

Finally, openness to trade is a major intermediating factor in the relationship between knowledge and growth. In an era of globalization, innovation is quasi-impossible in a closed economy. Trade integration, by contrast, is a powerful way of tapping into global knowledge through a rising tide of trade, foreign direct investment (FDI), technology purchases, and licensing. Abundant empirical evidence demonstrates that cheap access to equipment and machinery has a positive impact on total factor productivity, and thus growth. For instance, Coe and Helpman [1995] and Coe, Helpman, and Hoffmaister (1997) find that foreign knowledge embodied in trade in goods has a statistically significant positive impact on aggregate total factor productivity in importing countries. Schiff and Wang [2007] show that the impact increases the more trade occurs with industrialized countries. The latter evidence simply reflects the fact that about 80 percent of the world’s research and development (R&D) occurs in the developed world.

Other empirical evidence of the strong positive relationship between the knowledge economy and economic growth in both developed and developing countries is provided by Chen and Dahlman (2004) and by Poorfaraj, Samimi, and Keshavarz (2011).

The link between knowledge, growth, and employment is less clear-cut. On the one hand, the positive impact of higher growth on demand for labor is undisputed. On the other, it is not clear whether this uptick in labor demand will reduce unemployment. Much depends on the sectoral basis of growth, the propensity of sectors to hire labor as they grow, and profiles of job seekers. Clearly, moving to a knowledge-based economy leads to an increase in demand for highly skilled workers and, under most circumstances, to higher wages for this category of labor. But the impact on the unemployment rate and wage differentials depends on the skill profiles of job seekers in the economy. The empirical literature corroborates these theoretical intuitions. Studies show a strong positive relationship between the introduction of knowledge-intensive means of production, such as those based on information technologies, and demand for highly skilled workers (see OECD [2004] for a summary). But if the pool of unemployed workers is dominated by unskilled workers, overall unemployment may not decline.

A tendency for the labor market to polarize and for the wage gap to widen has been noted in studies conducted for developed countries (OECD 2004). In the United States, relative wages for less-skilled workers declined, while the overall unemployment rate remained low. The United Kingdom was marked by a similar growing wage gap between skilled and unskilled workers. In the other major European countries, there was no polarization in terms of wages, but the employment situation worsened for unskilled workers. Knowledge and technological change are not the only driver of these outcomes, however. The pressure of globalization has often been seen to exert a distinct impact on wage differentials, regardless of changes in technologies.

Variations in the impact of knowledge on employment diverge even more at the firm level. A rise in productivity (resulting from investments in knowledge) can reduce or increase employment in the short to medium term depending on context: more productive firms need fewer workers to produce the same amount of output because they are more efficient. Thus, if investment in knowledge significantly increases efficiency, jobs may be destroyed.

But more productive firms improve their cost competitiveness if growth in labor productivity is higher than wage growth—domestically and in competing countries with a similar wage rate—and this is good for employment. Further, higher productivity can lead to lower prices and higher demand, further favoring employment. And higher productivity in one sector can generate demand for goods and labor in related sectors if links exist, which is also good for employment.

Recent empirical studies have shown no significant long-run association between productivity growth and employment (Blanchard, Solow, and Wilson [2007] for France and the United States).6 But there is evidence of a clear, positive impact of agricultural productivity growth on employment, including in the nonfarm rural economy. The effect of productivity growth is, however, mediated by access to land. The employment effects are larger where access to land is more equally distributed (Thirtle and others 2001).

But productivity growth is an imperfect measure of investment in knowledge, as it can be driven by a host of factors (such as the business cycle and privatization). A more precise measure of [investment channel for] growing knowledge at the firm level is technological adoption. Here, too, the impact on employment depends on whether technology is embodied or disembodied in new jobs or new capital.

3. Schumpeter defines innovation as consisting of (i) new products and services, (ii) new processes, (iii) new ways to penetrate new markets, (iv) new supply sources or distribution methods, and (v) new industries (Schumpeter 1912/1961).

4. Economic theory emphasizes education and human capital as preconditions for absorbing new ideas and building a knowledge economy. Indeed, the availability of high-quality and abundant human capital makes it possible to absorb new ideas and to avoid diminishing returns to capital and labor (Lucas 1988).

5. The traditional models postulated that the growth rate of technology [or technological development] was exogenous.

6. According to Nordhaus (2005), the key lies in the evolution of demand for aggregate output [at least in the United States].
If technology is disembodied (as in the Solow model), existing jobs can take full advantage of new technology, in which case existing jobs become more valuable and more productive. No job destruction occurs and employment tends to increase at a fast rate. But if technology is embodied (as in the Schumpeter model), firms cannot increase their productivity without destroying jobs.

The reality no doubt lies somewhere between these two extremes. Most technologies can be adopted by existing workers with training (for example, those workers learning how to use new software) even if a more powerful computer is required (an example of technology embodied in new capital). Indeed, some sectors in the economy linked to the production or importation of the technology always create jobs when substantial new adoption of technology or knowledge occurs in the economy.

Empirically, technology adoption leading to product innovation has been shown to have a positive impact on employment at the firm level (for example, those workers learning how to use new software) even if a more powerful computer is required (an example of technology embodied in new capital). Indeed, some sectors in the economy linked to the production or importation of the technology always create jobs when substantial new adoption of technology or knowledge occurs in the economy.

In MENA the fastest-growing small and medium-sized enterprises (SMEs) are those that innovate (Stone and Badawy 2011). These enterprises also invest in training, quality systems, telecommunications systems, and computer literacy. In the same vein, Dutz and others (2011) find that the business environment, access to finance, and competition are necessary if innovation is to lead to job creation.

The evidence on the link between knowledge clusters and jobs is mixed. Some cluster policies seem to have a positive impact on employment. An interesting example is the proactive inclusion policies implemented in North Carolina (United States) to connect low-skill-intensive sectors to the dynamic life science cluster (Lowe 2007)—an example of how links between a cluster and a local economy can boost employment for both skilled and unskilled job seekers.

Last, we take the product of the coefficients representing the regional knowledge-growth effects and the country-specific employment intensities to derive country-specific knowledge-employment effects. This three-stage process is illustrated in figure A1.1.

The results of our estimates may be summarized as follows. Econometric analysis for MENA indicates that knowledge accumulation, as measured by the KEI (see box A1.1), tends to produce sustained positive effects on future economic growth. Specifically, a unit increase in the KEI for 1995 increases the average growth rate of real gross domestic product (GDP) per worker for the period 1996–2000 by 0.28 percentage point, while a unit increase in the KEI for 2000 increases the average growth rate of real GDP per worker for 2001–05 by 0.89 percentage point.

We estimated the employment elasticities with respect to growth for 16 MENA countries over two time periods: 1991–99 and 2000–09. The average for the 16 MENA countries is 0.82 for the former period, and 0.78 for the latter period, implying that for the average MENA country a 1 percentage point increase in GDP is associated with an average increase of 0.78 percentage point in employment over the following three years.

Finally, employment elasticities with respect to the KEI are much larger for the latter time period (2001–09). This is due primarily to the much larger estimated coefficient for the knowledge-growth effect for 2001–05 than for 1996–2000. Estimates of the elasticity of employment to the KEI range from 0.2 for Kuwait to 1.3 in Qatar for the year 2000 raises the average employment growth for Qatar by 1.3 percentage points.

Estimating the effects of knowledge on economic growth

New estimates of the employment effects of knowledge among MENA countries are provided here. Using the Knowledge Economy Index (KEI) as a measure of knowledge accumulation (box A1.1), we first estimate the knowledge-growth effects for MENA at the regional level. Next, we estimate for each MENA country the employment intensity of economic growth (as expressed by the elasticity of employment to economic growth).
As noted above, traditional macroeconomic theory has shown that productivity growth is an important source of sustained economic growth. Assuming that the key driver for productivity growth is knowledge accumulation, we can empirically estimate the effects of knowledge accumulation on economic growth in a straightforward manner by using the KEI as an indicator of knowledge accumulation and the growth of output per worker as a measure of economic growth. To improve the precision of the estimates, it is necessary to account for other factors that are known to affect economic growth, namely, the effects of initial GDP per capita and the growth of capital per worker.

Also, to avoid the possibility of reverse causality, we perform the estimation in a noncontemporaneous manner. More specifically, we empirically estimate the effects of the KEI in 1995 and 2000 on the economic growth rates of countries for the future periods of 1996–2000, and 2001–05, respectively.

To fully understand the structure and variables in the estimating equations, a brief discussion of the various sources of economic growth in a simple neoclassical growth model is necessary.

Theoretical framework

Assume that there exists an aggregate economic production function

\[ Y = A F(K, L) \]  \hspace{1cm} (1)

where

- \( Y \) is the level of aggregate output or real GDP
- \( K \) is the level of the capital stock
- \( L \) is the size of the labor force
- \( A \) is total factor productivity (a measure of the current level of technology)

A typical example of an explicit form of equation (1) is that of the Cobb-Douglas specification,

\[ Y = AK^{\alpha_k} L^{\alpha_L} \]  \hspace{1cm} (2)

where

- \( \alpha_k \) is the elasticity of output to capital
- \( \alpha_L \) is the elasticity of output to labor.
By assuming constant returns to scale, \[ \alpha_k = 1 - \alpha_a \]  
(3)
equation (2) therefore becomes
\[ \frac{Y}{L} = A \left( \frac{K}{L} \right)^{\alpha_k} \]  
(4)
By logging both sides and taking total differentials, it can be shown that equation (4) becomes
\[ \frac{\Delta \left( \frac{Y}{L} \right)}{\Delta t} = \alpha_k \frac{\Delta \left( \frac{K}{L} \right)}{\Delta t} + \Delta \left( \frac{A}{A} \right) \]  
(5)
The term of the left-hand side of equation (5) is the rate of growth of aggregate output per worker, which is simply economic growth in a “per worker” form. The equation therefore implies that there are two sources of growth for output per worker: growth in the amount of capital per worker and growth in total factor productivity (TFP).

\[ \frac{\Delta \left( \frac{Y}{L} \right)}{\Delta t} \text{average (1996–2000)} = \alpha_k \frac{\Delta \left( \frac{K}{L} \right)}{\Delta t} \text{average (1996–2000)} + \Delta \left( \frac{A}{A} \right) \text{average (1996–2000)} \]  
(6)
\[ \frac{\Delta \left( \frac{Y}{L} \right)}{\Delta t} \text{average (2001–2005)} = \alpha_k \frac{\Delta \left( \frac{K}{L} \right)}{\Delta t} \text{average (2001–2005)} + \Delta \left( \frac{A}{A} \right) \text{average (2001–2005)} \]  
(7)
Data for real GDP (in constant local currency units), real GDP per capita for 1996 and 2000 (in constant PPP terms), and labor force figures were taken from the World Development Indicators (WDI) database of the World Bank. The capital stock was constructed using gross capital formation (in constant local currency units), also obtained from the WDI database. The perpetual inventory method was used, with an assumed depreciation rate of 5 percent. To calculate the initial value of the capital stock, we used the average growth rate of gross capital formation for the first five years and applied the formula for the sum of an infinite geometric progressive series.

The regression results are presented in table A1.1. Regressions 1a and 1b estimate the effects of the KEI on economic growth without accounting for differences exhibited by the MENA countries. In Regression 1a, the KEI 1995 variable exhibits an estimated coefficient that is positive and highly statistically significant. The estimated value of 0.6947 implies that a unit increase in the KEI for 1995 tends to increase average annual growth of output per worker by 0.69 percentage point, holding all other factors unchanged. As noted in box A1.1, the KEI ranges from 0 to 10, and a unit increase is equivalent to an improvement of one decile or about 15 positions among the ordinal ranking of the 146 countries included in the KAM. The results from Regression 1b are qualitative and quantitatively similar to those from Regression 1a. In particular, the estimated coefficient of KEI 2000 is positive and highly statistically significant. The estimated value of 0.6398 implies that a unit increase in the KEI for 2000 tends to increase average annual growth of output per worker for the period 2001–05 by 0.64 percentage point.

The noncontemporaneous nature of the above analysis negates the possibility of reverse causality, whereby a positive relationship might result because higher rates of economic growth allow countries to invest more in knowledge. The noncontemporaneity thus provides additional support for the underlying result, which has important policy implications. It shows that...
knowledge accumulation or, equivalently, investment in knowledge, tends to increase economic growth over a sustained period of time. Therefore, developmental strategies that are geared toward enhancing the quantity and quality of knowledge acquisition, adaptation, generation, and use for economic activity are likely to increase long-term economic growth.\footnote{The above analysis does not reveal the precise channels through which knowledge accumulation can enhance economic growth.}

Regressions 2a and 2b are knowledge-growth regressions that include dummy variables for 17 MENA countries available in the KAM. Those countries are Algeria, Bahrain, Djibouti, Egypt, Iran, Jordan, Kuwait, Lebanon, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, the United Arab Emirates (UAE), and Yemen.

Regression 2a examines the effect of the KEI in 1995 on growth between 1996 and 2000, allowing for differences in the KEI-growth effect for MENA countries. We see that the estimated coefficient of the “MENA * KEI 1995” interaction term is negative and statistically significant. This implies that the KEI-growth effect for MENA countries is less than that for non-MENA countries for the period 1996−2000. More specifically, based on the results of Regression 2a, the KEI-growth effect for MENA countries is 0.2759 percentage point (= 0.5252 – 0.2493), whereas that for the average non-MENA country is 0.5252.

Regression 2b reestimates the specification in Regression 2a with the second time period, where the effect of the KEI for 2000 on average economic growth between 2001 and 2005 is assessed. We see that the estimated coefficient of the “MENA * KEI 2000” interaction term is now positive and statistically significant. This indicates that the KEI-growth effect for MENA countries is 0.8903 percentage point (= 0.7297 + 0.1606) greater than that of the average non-MENA country (0.7297 percentage point).

The regression results in table A1.1 show that MENA countries are similar to the rest of world in that increases in knowledge accumulation or investment in knowledge tend to lead to sustained positive effects on future economic growth. More specifically, our estimates for the MENA countries indicate that a unit increase in the KEI for 1995 tends to increase the average growth rate of real GDP per worker for 1996–2000 by 0.28 percentage point, while a unit increase in the KEI for 2000 tends to increase the average growth rate of real GDP per worker for 2001–05 by 0.89 percentage point.

### Employment intensity of growth in MENA countries

This section explores how employment in the MENA economies has increased with economic growth. Before we are able to empirically assess the effects of knowledge accumulation on employment creation, however, we must first determine the employment effects of economic growth, more commonly known as the employment intensity of growth or the elasticity of employment with respect to output. Employment intensity (or the employment elasticity of growth) is defined as how much employment growth is associated with 1 percentage point of economic growth.

\begin{table}[h]
\centering
\caption{Knowledge and economic growth in MENA: Cross-section regressions}
\label{table:a1.1}
\begin{tabular}{lcc}
\hline
Dependent variable: Growth rate of real GDP per worker & \multicolumn{2}{c}{Estimated coefficients} \\
\hline (Log) Initial GDP per capita (1996) & -1.1136*** & -1.3888*** \\
(Growth of capital per worker) & 0.2938*** & 0.4121*** \\
KEI 1995 & 0.6947*** & 0.6398*** \\
MENA * KEI 1995 & -0.2493* & MENA * KEI 2000 & 0.1606* \\
Constant & 6.6777*** & 9.9169*** \\
R squared & 0.5480 & 10.8696*** \\
Number of countries & 122 & 121 \\
\hline
\end{tabular}
\end{table

\begin{tabular}{lcc}
\hline
\multicolumn{3}{c}{Estimated coefficients} \\
\hline & 2001–2005 & \\
\hline (Log) Initial GDP per capita (2001) & -0.8058* & \\
(Growth of capital per worker) & 0.2892*** & \\
KEI 2000 & 0.5252** & \\
MENA * KEI 2000 & 0.6109** & \\
Constant & 5.1097** & \\
R squared & 0.4895 & \\
Number of countries & 122 & \\
\hline
\end{tabular}

Source: Chen, Diop, and Muller 2012.

Note: GDP = gross domestic product; KEI = Knowledge Economy Index; MENA = Middle East and North Africa.

Cross-section regressions - variables were averaged over respective time periods.

*, **, *** denote significance at the 90, 95, and 99 percent confidence levels, respectively.

Robust standard errors obtained using White’s correction for heteroscedasticity.
Methodology

To derive the estimation equation, we utilize a multivariate log-linear regression model with country dummy variables, $D_i$, interacted with log GDP:

$$\ln E_t = \alpha, D_i + \beta_i (\ln Y_t, D_i) + u_t$$

(8)

where

$E_t$ represents employment in country $i$ at time $t$

$Y_t$ represents output or GDP in country $i$ at time $t$

$D_i$ represents a country dummy variable for country $i$

Note that:

$$\frac{\partial E_t}{E_t} = \beta_i \frac{\partial Y_t}{Y_t}$$

Therefore, the elasticity of employment with respect to GDP for country $i$ is given as $\beta_i$.

But because changes in aggregate employment are likely to lead to changes in GDP, attempts to use equation (8) as the estimating equation would lead to biased estimates owing to reverse causality. Therefore, we stagger the time periods of employment and GDP in an effort to reduce the reverse causality effect. More specifically, we relate GDP at time $t$ to the moving average of aggregate employment at times $t+1$, $t+2$, and $t+3$.

This implies that the estimating equation will be:

$$ma(\ln E_t) = \alpha, D_i + \beta_i (\ln Y_t, D_i) + u_t$$

where

$$ma(\ln E_t) = \left[\ln(\ln E_{t+1}) + \ln(\ln E_{t+2}) + \ln(\ln E_{t+3})\right]/3$$

Using this econometric method, $\beta_i$ represents the average change in employment for the three future years associated with a differential change in the current year’s output. For example, an elasticity of 0.5 implies that every 1 percentage point of GDP growth in year $t$ is associated with an average employment growth of 0.5 percentage points for the years $t+1$, $t+2$, and $t+3$.

Figure A1.2 presents the estimated employment elasticities with respect to growth for 16 MENA countries for two time periods: 1991–99 and 2000–09. While there is large variation, ranging from 0.3 for Kuwait for 2000–09, to 1.6 for Algeria in 1991–99, most of the elasticities are less than 1. The average for the 16 MENA countries is 0.82 for the former period, and 0.78 for the latter period, implying that for the average MENA country a 1 percentage point increase in GDP is associated with an average increase of 0.78 percentage point in employment for the next three years.

![Employment Elasticity to Economic Growth](image)

Source: Authors.

Note: MENA = Middle East and North Africa.
Deriving the employment effects of knowledge in MENA countries

As mentioned above, to determine the employment generation effects of knowledge, we take the product of the coefficient representing regional knowledge-growth effects and the country-specific employment intensities, the results of which are presented in figure A1.3.

As can be seen, the employment elasticities with respect to the KEI are much larger for the later time period, 2000–08. This is primarily due to the much larger estimated coefficient for the knowledge-growth effect for 2001–05 than for 1996–2000 (see table A1.1). Estimates range from 0.2 for Kuwait to 1.3 in Qatar, both in the 2000–09 period. The coefficient value of 1.3 for Qatar implies that a unit increase in the KEI for the year 2000 tends to an increase of 1.3 percentage points in Qatar’s average employment growth.

References


Figure A1.3

Employment elasticity to KEI in MENA countries

Source: Authors.

Note: KEI = knowledge economy index; MENA = Middle East and North Africa.
Annex 1. Econometric model and literature analysis


To illustrate the role of vision, leadership, and governance in creating a knowledge economy, a set of comparator countries has been chosen that match at least some of the structural characteristics of the Middle East and North Africa (MENA). Table A2.1 categorizes the chosen comparator countries. While not being as oil- and gas-rich as the MENA countries, these countries were chosen for their large natural-resource-based sectors, of similar importance to oil and gas in the MENA countries. All these countries are already relatively wealthy or have had rapid rates of economic growth (China and India). Within this sample of countries there is a range of administrations, from full democracies to authoritarian regimes. While seven are democracies, three of them—Malaysia, the Republic of Korea, and Turkey—evolved from authoritarian states, and only Korea has made it to full democracy. Only two, Finland and Norway, have been full democracies for some time. Two still have hybrid administrations—Hong Kong SAR, China; and Singapore. China is an authoritarian state with very impressive economic performance. But the key to China’s success, as will be explained below, is not so much that it is authoritarian, as that it is a development-oriented state.

The resource-poor, labor-poor category consists of Hong Kong SAR, Ireland, and Singapore. Hong Kong SAR and Singapore are famous for having developed rapidly in the 1970s through the 1990s to reach the ranks of developed economies. Both are still hybrid states, whereas Ireland is a democracy. All three have had impressive development, although Ireland crashed in the aftermath of the 2008 global financial crisis.

The resource-poor, labor-rich category consists of China, India, Korea, and Turkey. China and India are extreme examples of these characteristics. Although they are still poor countries they have had spectacular growth, particularly China. They are also fascinating because of their very different governance systems. Korea is relevant because it also has had impressive growth and has transitioned from an authoritarian regime to a full-fledged democracy. Turkey is included because it is a large country that has been performing very well in the past five years, and, as it has a majority Muslim population, is seen by many as a relevant model for other countries in MENA.

The resource-rich, labor-poor category consists of Finland and Norway. Finland is rich in natural resources in the forestry and mining sectors, and Norway in the fisheries sector and only more recently in the oil and gas sector. Although they are very different from the MENA countries since they are both very strong democracies, they are relevant because they show how democratic regimes can successfully provide vision and coordinate different interest groups. Norway is also relevant for the oil-rich Gulf States because it has created special funds from its oil wealth, which it is managing successfully.

The resource-rich, labor-rich category consists of Malaysia. Other countries such as the United States, Canada, or Australia could have been added, but they have different characteristics. Malaysia, on the other hand, is relevant both because it is a relatively large Muslim country, and also because it has transitioned successfully from an authoritarian regime to a democracy, even if not completely.

The rest of this annex will summarize the development strategies of these countries, including the extent to which they have developed strategies for the use of their natural resources, and how they have created consensus or other mechanisms to implement and adjust those strategies.

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1. This annex is based on Dahlman (2012).
2. Along with Korea and Taiwan (China), they have been variously called the Asian newly industrialized economies, the "Gang of Four," and the East Asian "Tigers."
3. For the history, challenges, and prospects of these two giants, see Dahlman (2012).
Although the comparator countries are different, all present several relevant lessons that are worth keeping in mind in developing strategies for the MENA countries.\(^4\)

### Differences

There are many different paths to sustained growth and development. No two paths are identical, even for countries with similar characteristics. Take, for example, Finland and Norway. Both are small Scandinavian countries, but Norway’s development path is quite different because of its oil wealth. Or take China and India, the two most populous countries in the world. China has taken the traditional East Asian labor-intensive, manufacturing-export route while India has not.

Not only is every path different, but no strategy is successful forever. Challenges change over time and any growth process necessarily involves responding to these challenges. As domestic and international conditions change, it is necessary to adjust and even sometimes radically restructure strategies.

### Commonalities

Nevertheless, there are some generic commonalities across these successful countries.\(^5\)

The first is vision and leadership within the framework of a strong, development-oriented state. The role of leadership and effective government in explaining the performance of rapidly growing economies is noted in the 2008 report of the Commission on Growth, a high-level panel chaired by Nobel laureate Michael Spence. The commission examined 13 of the world’s economies that had achieved average annual growth rates of at least 7 percent for 25 years or more in the post–World War II period.

Policy makers have to choose a growth strategy, communicate their goals to the public, and convince people that the future rewards are worth the effort, thrift, and economic upheaval. They will succeed only if the promises are credible and inclusive, reassuring people that they or their children will enjoy the full shares of the fruits of growth [Commission on Growth and Development 2008, 3].

The most rapidly growing comparator countries have had strong leadership and effective governance, although to varying degrees. China, Malaysia, and Korea had strong leadership in their early years and articulated a continued vision in their five-year-development plans. In Singapore it was the vision of Lee Kwan Yew, who ruled the country from 1959 to 1990 and institutionalized a very capable government. At the other extreme, Hong Kong SAR’s vision was to be a laissez-faire economy, and it was very successful until it fell back technologically. Then it articulated a stronger vision based on strong functional intervention, particularly in funding higher education and research and development (R&D). In Turkey the initial vision was provided by Ataturk, who secularized the former caliphate and created the nation-state of Turkey.

In Finland the vision was provided by the Ministry of Finance and central bank after the 1991 crisis, institutionalized through the creation of the Committee of the Future in Parliament (table A2.3). In Ireland during the difficult years of the 1980s, political parties, labor, and business leaders developed the Tripartite Agreement (to be renewed every three years) as a guide. Norway succeeds by being a mature democracy, whose political parties have been mindful to look out for the long-term interests of citizens. This is made evident by the way they have managed the country’s oil and gas windfalls for the benefit of future generations, while investing in education for the present generation. India has created five-year plans, but the government has not been very successful in implementing them because of a fragmented party system.

The second is accountability for performance. In the case of top-down countries, which have had authoritarian regimes or single-party governments that stay in power for a long time, there has been an explicit or implicit social contract to improve social welfare. In China, Korea, and Malaysia, which have been the most authoritarian of states, there has been a more explicit social contract that leads to strong accountability for performance. According to the contract, citizens give up the right to elect their government in return for strong economic performance—and the governments have delivered on this contract. In Turkey there was no strong social contract after Ataturk. Weak and ineffective governments mismanaged the economy, and the military had to intervene every decade or so to stabilize it. It was only after Turgut Ozal’s liberalization reforms of the 1980s, and the growing maturity of the political system in the past decade, that a government has survived elections and been able to perform.

In Singapore, a hybrid state, the bargain has not been so explicit since there are elections, but the government is very development oriented and manages the economy to induce growth. In Hong Kong SAR, there have been no free elections, and the implicit social contract with the government has been to produce results in terms of economic growth.

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4. For a rich and insightful book on the lessons of the experiences of Singapore, Finland, and Ireland, see Yusuf and Nabeshima (2012).

5. Tables A2.2 and A2.3, which appear at the end of this annex, compare countries that took a top-down approach with those that adopted a more bottom-up approach in eight key areas. For a useful summary and guide of some of the key elements of successful developing economies focusing on the role of government, public-private interactions, and consensus building, see Devlin and Moguillansky (2011).
In the democracies, accountability is, in theory, assured by the ability to change the government if it is not performing. This has worked in Finland, Ireland, and Norway, which are mature and multiparty democracies that have found ways to provide some continuity to their longer-term strategies. In Ireland this was done through the mechanism of the Tripartite Agreement, and in Norway the agreement on the Oil Fund was part of this longer-term vision and accountability. In India the federal and provincial governments can be changed through elections, but there has been little accountability. This is because politics are based on personalities and local issues, and government cannot implement policies because of the extremely fragmented nature of the Indian political system. At the federal level, since the late 1970s there have been very weak coalition governments.

The third is the capability of the government. This includes the quality of government officials, macro stability, and effective institutions and mechanisms for implementation. A corollary is coordination across government ministries and the ability to react quickly to changing conditions (that is, the ability to restructure). In the five Asian economies, government service is highly regarded and the government and civil services are able to attract high-quality staff. They enhance the capability of the government by having many think tanks to provide input into policy, and have specialized high-level units that help coordinate and implement these policies. In the five Asian economies, this capability was seen in how rapidly these countries responded to the 1997 Asian financial crisis. Malaysia’s prime minister, Mahathir Mohamad, even defied the International Monetary Fund (IMF) by refusing its advice and financial assistance, and was vindicated. In the other countries, the capability has been more variable. In the two Nordic countries, there is also a high regard for government service and the governments have been quite capable, as is seen in Finland’s quick response to its 1991 trade and financial crisis. In India top government officials are very capable, but the government has difficulties in coordinating and implementing policies, even though there is a high degree of planning.

A fourth is a move toward the market. All the economies have moved more toward the market in the past 40 years (except Hong Kong SAR, which has been the poster child of the laissez-faire market since the British period). Singapore and, to a lesser extent, Malaysia have been also quite open to market freedom, although as noted Malaysia has intervened in the market through its affirmative Bumiputera action policies. Korea has also moved more toward the market, particularly after the defects of excessive government support of its large chaebols were revealed during the 1997 financial crises. China’s rapid growth since the end of the 1970s, as well as India’s acceleration in growth, which started in the early 1990s, have been due to domestic-market-oriented reforms, as well as the opening up of their markets to the global economy. Ireland’s transformation into the Celtic tiger also occurred as it moved from being an overly regulated economy to a more investor-friendly, export-oriented economy after its poor economic performance in the 1980s. Finland also moved more toward the market after its 1991 economic crisis and entered into the European Union (EU). Most of the countries, however, have seen some retreat from the market since the global financial crisis revealed the downside of unregulated markets, and the need for more government support to industry and the shoring up of social safety nets.

The fifth is an outward orientation. The report of the Commission on Growth (2008) concluded that the most important characteristic of fast-growing economies was their outward orientation, which they benefited from in two ways:

One, they imported ideas, technology, and knowhow from the rest of the world. Two, they exploited global demand, which provided a deep, elastic market for their goods. The inflow of knowledge dramatically increased the economies productive potential; the global market provided the demand necessary to fulfill it. To put it very simply, they imported what the rest of the world knew, and exported what it wanted (Commission on Growth and Development 2008, 22).

The hallmark of the development strategy of the East Asian economies has been their outward orientation. For the two island economies of Hong Kong SAR and Singapore, this started with their roles as entrepots of regional trade. Even as early as 1970 the share of exports of goods and services in gross domestic product (GDP) was already over 100 percent for Singapore and nearly 100 percent for Hong Kong SAR. It was the key plank of their development strategy, driven by the limited domestic market and the realization that there was much to profit from interacting with the rest of the world. Initially both countries focused on attracting foreign direct investment (FDI) to produce labor-intensive manufacturing, given low costs and disciplined labor. As wages rose they moved to higher-value activities and eventually into high-value services, mostly finance- and trade-related services. Malaysia learned from its neighbor, Singapore, and followed a similar export-oriented strategy. By 1970 its exports of goods and services were already over 40 percent of its GDP, and by 2000 they were over 100 percent. Korea also embarked on an export-oriented development strategy in the 1970s, and by 1980 the share of exports of goods and services in its GDP was over 30 percent, eventually growing to 52 percent by 2010. China arrived at this strategy more slowly and gradually. It set up its first export-processing zone in the late 1970s. By 1990 exports of goods and services were 16 percent of its GDP and by 2005 they were 37 percent, which is very high for a large economy such as China.

Finland had a thriving barter trade with the Soviet Union, and by 1980 the share of exports of goods and services in its GDP was already over 30 percent. But when the Soviet Union fell apart in 1991, Finland had to restructure its economy and find other export markets. It focused on telephones, and by 2000 the share of exports of goods and services in its GDP had...
increased to nearly 44 percent. Ireland’s development strategy was focused on attracting foreign investment as an entry point to the European Common market. By 1990 its exports of goods and services were nearly 57 percent of its GDP, and this share increased to nearly 100 percent by 2000 [as in Hong Kong SAR and Korea, this share was composed largely of manufactured products]. In Norway exports of goods and services as a share of GDP were already 36 percent in 1970, and until 1975 manufactured products made up 60 percent of exports. But once oil exports picked up in the late 1970s, the share of oil in merchandise exports increased to over 60 percent by 1985. India was the slowest to focus on exports. It was not until the 1991 financial crises that it liberalized its economy, as part of the conditionality for getting loans from the IMF and World Bank, but its exports of goods and services as a share of GDP did not go above 10 percent until the late 1990s. Even in 2010 this share was barely above 20 percent.

A sixth is tapping global knowledge. This is part of the outward orientation already noted above but deserves special emphasis. Hong Kong SAR, Malaysia, and Singapore have been very effective at tapping into global knowledge through trade and FDI. Korea tapped into global knowledge through trade, technology transfer, and foreign education, but it followed the Japanese model of restricting FDI. Malaysia also tapped into global knowledge through trade and made more use of FDI than Korea. China, however, is the best example of the successful use of all channels to tap into foreign knowledge: trade, FDI, technology licensing, sending students abroad for tertiary education, exploiting its diaspora, and copying and reverse engineering.7

Ireland has also tapped very effectively into global knowledge, particularly through trade and FDI, like Hong Kong SAR and Singapore. Finland has tapped into global knowledge through trade, technology transfer, and foreign education. Like Korea it has not made effective use of FDI, but has instead developed strong local companies—Nokia, in particular.

India has been the least effective at tapping global knowledge through all means. It has been a much more closed economy than the others to trade, to technology licensing, and, to a lesser extent, to FDI. Since the 1990s it has opened up more to FDI, but is probably still the most restrictive of the comparators. Also, since the late 1990s it has been more open to tapping its diaspora, which has been critical for the development of its information-enabled service exports.

A seventh is investment in education. Singapore began to invest heavily in technical education to increase the skill of its labor force, as wages rose and its labor costs became uncompetitive. Its higher education focused mostly on engineering sciences and technical areas, not liberal arts. It also developed a program of subsidizing multinational companies to train more workers than were needed for their own operations, as a way to expand the skill base of the economy to attract other firms. Like Singapore, Malaysia began to invest heavily in education and skills development, as a strategy to attract higher-value foreign investment. Hong Kong SAR has had a higher average educational attainment than Singapore or Malaysia since the 1970s and has maintained that lead, but has been relatively late in focusing on higher education. But in the 1990s, as the government realized it was falling behind in higher education and losing competitiveness relative to its East Asian neighbors, it expanded higher education. It created the Science and Technology University of Hong Kong and built this up to become one of the premier universities of Asia. Korea also invested very heavily in education as part of its overall development strategy. It had to increase its investments in education to assimilate and use foreign technology. Since initially it did not want to rely on FDI, it had to rapidly ramp up its higher education to increase its investments in R&D. By the late 1990s it had increased its tertiary enrollment rate to almost 80 percent, and by 2010 this had increased to more than 100 percent.

Norway has had a high average educational level since 1970 and increased this to 12.3 years by 2010, which is the highest among the comparators. But it has not been able to increase its tertiary enrollment rates as much as Korea or Finland. Finland has one of the world’s best education systems; providing access to quality education has been considered a key responsibility of the government [Dahlman, Routti, and Antilla 2007], and higher education is virtually free. When the government and the private sector decided to switch strategies during the 1991 crisis to focus on the budding information technology [IT] industry, the higher education sector ramped up training of the specialized manpower that was required for it. It increased its tertiary enrollment rate from 45 percent in 1990 to 67 percent in 2005 and 92 percent by 2009. Ireland had the highest average educational level in 1970 among the comparator countries, although its tertiary enrollment rate was lower than that of Finland or Norway. But as part of its strategy to attract high-technology FDI in the 1990s, it increased its tertiary enrollment rate from 28 percent in 1990 to 50 percent in 2000 and 61 percent by 2009.

China and India offer an interesting contrast. As the poorest economies in the group they have had, and still have, the lowest average educational level and tertiary enrollment rates. India initially focused on training an elite cadre of engineers to run its large state enterprises that controlled the commanding heights of the economy. In the 1950s it set up the famous Indian Institutes of Technology and in the 1960s the Indian Institutes of Management. But it neglected basic education while China invested heavily in primary education. In 1970 the average educational attainment of the Chinese population was 3.4 years, twice that in India. But as a result of the Cultural Revolution, which basically shut out higher education from 1965 to 1975, even by 1980 China’s tertiary enrollment rate was just one-fourth that of India, which was low at just 5 percent. By the 1980s China realized the importance of higher education and started expanding enrollments. In the mid-1990s, as it was moving up the technology ladder and implementing its industrial and export strategy, it began to expand enrollment entry rates into higher education by 50 percent per year [Dahlman, Zheng, and Wang 2007]. By 2010 China’s average educational attainment was...
level as well as its tertiary enrollment rate were more than 60 percent higher than India’s. Thus even while China’s tertiary enrollment rate was just 26 percent in 2010, there was a large critical mass of tertiary-level graduates.

The 2012 Arab Knowledge Report rightly focuses on the critical need to improve education in the Arab world to transform these countries into knowledge economies. Although the 2012 report focuses mostly on basic education, it notes that tertiary education is the most critical and will have to be improved considerably to leverage the potential of the Arab countries (Maktoum Foundation and UNDP 2012).

An eighth investment and the use of information and communication technology (ICT). Nearly all the 10 comparators have taken advantage of the ICT revolution in one way or another. Finland and Korea have become large producers of hardware—Finland specialized in digital phones and Korea became a much more diversified producer of electronic hardware, from digital chips to phones, computers, and LCD televisions. Ireland and Singapore attracted FDI to produce ICT hardware and ICT-related services and also used ICT to reduce transactions costs throughout the economy. In Singapore ICT was part of an explicit development strategy of the government to lead the transformation of the economy. Malaysia also focused on the ICT sector as a key element of its development strategy. Like Ireland, it attracted FDI to produce ICT hardware and software. Its plans included the creation of a multimedia super corridor in the 1990s, which was partly thwarted by the 1997 Asian financial crisis.

China attracted FDI to produce ICT hardware but also developed a strong ICT services sector, and uses ICT throughout the economy to reduce transactions costs. India is not a producer of ICT hardware, but it has developed a strong capability in ICT-related export services and, as noted before, that sector has been leading its economic growth.

Hong Kong and Norway are exceptions in that they did not become major producers of ICT hardware or software or ICT-enabled services. But both economies have used ICT to reduce transactions costs in their economies.

References


### Annex 2. Some inspiring country experiences

**TABLE A2.2 Summary of comparators using a top-down approach**

<table>
<thead>
<tr>
<th></th>
<th>China</th>
<th>Hong Kong SAR</th>
<th>Korea</th>
<th>Malaysia</th>
<th>Singapore</th>
<th>Turkey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Development oriented</strong></td>
<td>Five-year plans, development-oriented state, strong industrial policy combined with horizontal policy.</td>
<td>Relatively late horizontal policies.</td>
<td>Plans, strong industrial policy combined with horizontal policy.</td>
<td>Plans, social engineering, strong industrial policy combined with horizontal policy.</td>
<td>Plans, social engineering, horizontal policies but within detailed plan.</td>
<td>After Ataturk, lack of vision and long-term planning plus poor control of economy led to decennial economic crisis.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Multiparty democracy since 1950 but lack of accountability led to military interventions until 1980s.</td>
</tr>
<tr>
<td><strong>Capability of government, coordination, ability to react includes macro stability, investment climate</strong></td>
<td>State council; government service highly valued.</td>
<td>Moved toward more government coordination.</td>
<td>Economic planning board; government service highly valued.</td>
<td>Economic planning unit.</td>
<td>Economic development board; very highly paid civil servants.</td>
<td>Lack of capability and economic mismanagement led to recurrent crisis until late 2000s.</td>
</tr>
<tr>
<td><strong>Move toward the market</strong></td>
<td>Move toward the market and improvement of investment climate.</td>
<td>Very market oriented from beginning, excellent investment climate.</td>
<td>Move toward the market and improvement of investment climate.</td>
<td>Move toward the market and improvement of investment climate.</td>
<td>Very market oriented; excellent investment climate.</td>
<td>Move toward market since Ozal liberalization in 1980.</td>
</tr>
<tr>
<td><strong>Integration into world economy and export diversification</strong></td>
<td>Increasingly outward oriented.</td>
<td>Very outward oriented from beginning.</td>
<td>Very outward oriented.</td>
<td>Very outward oriented.</td>
<td>Very outward oriented from beginning.</td>
<td>Ozal reforms of 1980s started integration but proceeded slowly, and exports still low as percentage of GDP.</td>
</tr>
<tr>
<td><strong>Tapping into global knowledge</strong></td>
<td>Used all channels.</td>
<td>FDI and trade.</td>
<td>Trade and technology licensing and foreign education.</td>
<td>FDI and trade.</td>
<td>FDI and trade.</td>
<td>FDI more important than trade until recently.</td>
</tr>
<tr>
<td><strong>Investment in education</strong></td>
<td>Rapid ramp up of education as part of upgrading strategy.</td>
<td>Relatively late-comer, but has an upgrading strategy.</td>
<td>Rapid build-up of education capability.</td>
<td>Heavy focus on education.</td>
<td>Focus on technical education as part of integration strategy.</td>
<td>Investment in education, especially tertiary has increased in past two decades.</td>
</tr>
<tr>
<td><strong>Investment and use of ICT</strong></td>
<td>Key element of strategy including production of hardware and in use to reduce transactions costs.</td>
<td>Not so much in production, but in use for coordination of global supply chains.</td>
<td>Key element of strategy including production.</td>
<td>Key element of strategy, including production of hardware, multimedia corridor.</td>
<td>Key element of strategy, including production but also heavy emphasis on use.</td>
<td>Not much production of ICT inputs or software, more consumer electronics.</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation.

Note: FDI = foreign direct investment; ICT = information and communication technology.
### TABLE A2.3  Summary of comparators using a bottom-up approach

<table>
<thead>
<tr>
<th>Finland</th>
<th>Ireland</th>
<th>India</th>
<th>Norway</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accountability for performance through democracy or social contract</strong></td>
<td>Very consensus-based and accountable democracy.</td>
<td>Democracy but also explicit social contract.</td>
<td>Fractious democracy with little capacity to implement.</td>
</tr>
<tr>
<td><strong>Capability of government to react</strong></td>
<td>Working for government held in high regard. Economic policy course to create capability and foster coordination.</td>
<td>Tripartite agreement. Industrial Development Authority and Forfas (Ireland’s policy advisory board for enterprise and science).</td>
<td>Capable individuals in federal government, but coordination and ability to implement has been weak.</td>
</tr>
<tr>
<td><strong>Move toward the market</strong></td>
<td>Has moved toward market since 1991 crisis, good investment climate since then.</td>
<td>Has moved toward market since 1980s, strong investment climate.</td>
<td>Has moved toward market since 1991, but still has poor investment climate.</td>
</tr>
<tr>
<td><strong>Integration into world economy and export diversification</strong></td>
<td>Doubled share of trade in GDP over past 30 years and moved into higher-technology products and services.</td>
<td>Very integrated through FDI; oriented to use Ireland as base for entry into EU market in ICT and pharmaceuticals.</td>
<td>Not so integrated, has missed out on labor-intensive exports but exploited information-enabled service exports.</td>
</tr>
<tr>
<td><strong>Tapping into global knowledge</strong></td>
<td>Trade, technology licensing, education.</td>
<td>FDI, trade, and diaspora.</td>
<td>Still limited in FDI, trade, and licensing, though higher in foreign education.</td>
</tr>
<tr>
<td><strong>Investment in education</strong></td>
<td>Very strong investments in tertiary education, particularly after 1991 crisis.</td>
<td>Explicit focus as part of industrial strategy. Used EU structural funds to invest in higher education and training.</td>
<td>Early investments in elite engineering education, but poor overall educational attainment.</td>
</tr>
<tr>
<td><strong>Investment and use of ICT</strong></td>
<td>Focus on this sector after 1991 crisis as strategic sector, particularly telecommunications equipment and use of ICT.</td>
<td>Focus ICT sector as key element of attracting FDI for exports to EC market.</td>
<td>Software and ICT-enabled sector have been core of growth and competitiveness.</td>
</tr>
</tbody>
</table>

**Source:** Authors’ compilation.

**Note:** EU = European Union; FDI = foreign direct investment; ICT = information and communication technology.
Annex 3
A country application of the knowledge economy model: A bird’s-eye view of the Arab world

Arab countries, like many others around the world, are confronted with the double challenge of carrying out institutional reforms while simultaneously attempting to diversify their economies. In this book, chapter 4 focused on institutional reforms, chapters 5–7 dealt with a mix of institutional reforms and diversification policies, and chapters 8 and 9 focused on diversification.

This annex delves into this challenge, touching on specific issues facing both the resource-poor and resource-rich countries of the region. Strategic approaches for implementing change are highlighted in light of the need for ambition, pragmatism, and a new social contract.1

Thinking in terms of institutional endowments and economic diversification

Economic development can be understood through a two-dimensional analytical and policy matrix that is closely linked to the knowledge- and innovation-driven development approach advocated in this report. The first dimension (the horizontal axis in table A3.1) consists of top-down creation of good governance institutions that ensure the rule of law and efficient regulations. The process of creating those institutions may be referred to as a “Weberian process,” after Max Weber, the theoretician of the modern state. The second dimension (vertical axis) relates to the expansion of dynamic segments of the economy, whose growth helps alleviate development constraints. These bottom-up solutions result in innovation, both institutional and technological. They may be dubbed a “Schumpeterian process,” after Joseph Schumpeter, the theoretician of innovation.

The desired outcome of the interplay of institutional improvements and greater economic diversity is dynamic economic enclaves coexisting with more or less functional institutions. Needless to say, the Weberian and Schumpeterian dimensions in a given country are not entirely independent, as they share many underlying factors. For that reason, positive dynamics can be generated by making salutary changes on either dimension. Institutional reforms, even if limited in scope, can facilitate economic diversification; concomitantly, successful diversification creates a climate that favors reform (chapter 3).

Countries from all over the world can be situated within the matrix of institutional endowments and economic diversification. In the cell corresponding to low institutional endowments and a small degree of diversity (dark blue cell), instability impedes learning and frustrates the search for diversity. Countries in this situation are caught in a vicious circle or “infernal trap.” Somewhat better off are countries that have benefited from growth and diversification opportunities for various reasons, geographic or climatic (gray cell). They have a real opportunity to leverage their position to reform their economic and institutional regimes. But, some countries—in particular, the resource-rich ones in which vested interests jealously guard their privileges—have not been able to pursue a knowledge-based path in an efficient and sustainable manner. They have experienced a sort of “frustrated promise.” Other countries with relatively weak institutions but unusually dynamic sectors or cities have been able to reach a higher stage of economic and industrial diversity, such as China and India. But they both also remain confronted with the challenge of moving from “good enough” to “good” institutions (green cell).

Among the countries with strong institutional endowments, some face serious difficulties in diversifying their economies, especially when the entrepreneurial class does not have critical mass or is not vigorous enough (yellow cell). Others—notably the social welfare/market economies of the developed world—have been able to renew their economic and industrial base through sustained innovation efforts, allowing them to avoid institutional sclerosis (violet cell). Finally, there are those countries that have been able to constantly adjust their institutional framework and to generate innovative ventures (light blue cell). The issue here is to manage diversity, notably in liaison with migration trends that bring new perspectives and opportunities for change, but also potential instability.

Most of the countries of the Arab world fall into the category of low institutional endowments and medium internal diversity.

1. This annex builds on various studies, including CMI (forthcoming 2013), Djelfat (2012), Kuznetsov (2012), Uppenberg (2012), and van der Meer (2012). It provides a synthetic analysis of how different Arab countries can make the move to a knowledge- and innovation-based economy. The objective is not to treat the country situation and related policy issues in an exhaustive manner, but to provide suggestions on key trends and policy directions for implementing change.
and heterogeneity (grey cell). The question is whether they will evolve toward higher internal diversity (yellow cell) or to better institutional endowments (violet cell)—or both. The long-term sustainability of economies with low institutional endowments has been the subject of growing scrutiny, as weak institutions are becoming increasingly problematic in the era of globalized and open societies.

As discussed elsewhere in this report, Arab economies can be divided into two basic types—the resource-rich and the resource-poor—each with a set of contrasting features. Their approach to the knowledge economy has differed in the past and very likely will continue to differ. This annex examines those approaches, beginning with the resource-poor countries.

Resource-poor countries—located in the southern and eastern Mediterranean area—have the common imperative of creating jobs in large numbers, particularly for youth. Only efficient economies can generate jobs in the necessary quantity, and the best way to build an efficient economy is by widening popular participation in economic life. Across the region, countries have embarked in one way or another in a process of transformation in response to calls for greater inclusion and democratization. In Morocco and Jordan, that process has unfolded under monarchies that have taken steps to open up their societies. In Tunisia and Egypt, the process has resulted in rejection of an authoritarian regime. Leaders in all four countries know that they must respond to the demand for greater participation in political life and for an economy capable of creating jobs. Satisfaction of those demands would constitute the basis for a new social contract between government—one that should promise transparency and efficiency and support innovative undertakings of all sorts—and civil society, in its various incarnations, which all should find a way to support the reforms required for greater democracy and economic efficiency. The sooner such a new social contract can be struck and consolidated, the better it will be for the people of the region.

The region’s resource-poor countries have common prospects for diversification, with a relatively large span of possibilities, as surveyed in chapter 8. These range from information and communication technology (ICT)-related sectors to green-growth–induced activities, with opportunities in high-profile tourism and creative industries, as well as established sectors such as food processing, which are important in much of the region. These opportunities for diversification can be seen as low-hanging fruit that can be gathered through fine-tuned efforts that combine, among other things, training programs, quality certification, and trade promotion. Efficient exploitation of these niches is key to creating, strengthening, and sustain-

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ing a nationwide climate of self-confidence and trust. Early success will help to facilitate a virtuous cycle of further reform.

Regarding the spatial diversification of their economies, these countries start from a common baseline, that is, technoparks and industrial zones. But the tradition of centralization in Arab countries and the concomitant deficit of local administrative capabilities constitute hurdles to local development. For that reason, technoparks and industrial zones are developing unevenly throughout the region and are dependent on the availability of certain assets—chiefly entrepreneurial and academic talent—and on the governance structures in which those assets operate. Innovation sites should be strengthened, expanded, and replicated, as appropriate, through the provision of adequate incentives, notably for attracting foreign firms that are the major sources of technological and management upgrading.

The region’s resource-poor countries share a need to make institutional reforms, although some have a much longer way to go than others, as discussed below. The reform agenda includes (i) completing or adjusting reforms to the business environment, which in all of the countries considered still presents weaknesses despite significant progress in recent years; (ii) cutting prices for telecommunications and expanding access to the Internet (and particularly to broadband); (iii) strengthening their innovation systems and expanding innovation policies to embrace more than science and technology policies, consistent with a more dynamic view of the process of innovation; and (iv) improving the education system at all levels.

Finally, several countries in the region can benefit from a wide range of support from the international community. The so-called Deauville Partnership will bring new and expanded agreements on trade and foreign direct investment (FDI) (chapters 3 and 4). Recent commitments from the European Bank for Reconstruction and Development (EBRD) and support from the European Union (EU) for research and development (R&D), innovation, and education are the most prominent examples of assistance from the international community.

Alongside common issues and perspectives one finds important differences. Three of the region’s resource-poor countries—Jordan, Morocco, and Tunisia, have relatively advanced policies related to the knowledge economy, policies that have begun to stimulate economic activity, create jobs, and produce wealth. Of the three, Morocco and Tunisia seem to be better equipped to plan and execute strategies, being endowed with government institutions that have demonstrated the capacity for action and delivery. They are also more advanced in their efforts at economic diversification. By contrast, Jordan and Lebanon seem to exhibit a somewhat more entrepreneurial climate and are better able to convert rapidly innovative potential into concrete activities, markets, and jobs.

Considering these similarities and differences, some strategies and policies that seem appropriate for advancing the countries of the southern and eastern Mediterranean along the road to the knowledge economy are sketched out below. The specific cases of Morocco and Jordan are discussed in detail. Viewed through the lens of the policy principles laid out in chapter 3, the proposed approaches differ depending on each country’s degree of advancement toward the knowledge economy, the capacity for government action, and the urgency of the need for results, especially in terms of job creation. Current events provide what is perhaps a unique window of opportunity for strong and determined actions. Those actions may be painful in the short term but promise substantial gains in the medium to long term. In all cases, the political economy for change, shaped by context-specific factors, will be a major determinant in the choice of policy actions and instruments.

**Morocco**

Morocco has experienced sustained economic and social development over the past decade. Between 2000 and 2010, the growth rate averaged 5 percent, and unemployment dropped from 14 to 9 percent, in part thanks to the new knowledge-economy-based regime. But further progress is necessary, as the overall competitiveness of the economy has deteriorated. Exports cover only about 50 percent of imports, and 25 percent of export income comes from phosphates alone (Morocco is the world’s leading producer).

The reforms undertaken over the past decade have improved the investment climate and governance. Reforms and initiatives related to the knowledge economy began in the early 2000s with the liberalization of mobile-telephone markets. More recently, important plans were launched to diversify the economy through the establishment of highly competitive industrial platforms in several sectors (Plan Emergence), the revamping of agriculture (Plan Vert) and fisheries (Plan Halieutis), and the digitization of the economy (Plan Maroc Numérique) (box A3.1). Plans have been launched to upgrade the education system (Morocco still suffers from a high rate of illiteracy) and to forge a more effective innovation policy.

Broader and deeper reforms are necessary to cope with the country’s challenges. The king has advanced the democratization process, and a new government has come into power, but the most pressing challenge is to accelerate the application of the new economic model, which promises to be a source of productivity, competitiveness, and employment. Hastening the application of the new model will require not only introducing new policies, but also overcoming impediments such as protection from competition in some industries (which allows incumbents to collect rents), corporatist or guild-like behaviors in the school and university system, and bureaucratic rigidities in the administrative system.

The first task is to improve coordination of the various plans and reforms that have been launched by the government. The necessary coordination should take place at the highest level of the government, bringing in all affected ministers as well as top officials of the sector agencies involved in the shift to the knowledge economy. Better coordination is necessary to cut government spending in the face of the yawning budget deficit. At the same time, there is a need to mobilize the society as a whole, in all its richness and diversity, around the new development model and a clear vision for the country articulated around knowledge and innovation. Government and business leaders who have led the development of the sector plans and key policy reforms could act as core change agents to articulate the vision.
Transforming Arab Economies

Engineering the knowledge economy: The Moroccan example

New plans and programs to boost economic growth are central to Morocco’s new national vision. These plans can be divided into three categories: (i) functional plans that directly address one or more of the pillars of the knowledge economy (the Morocco Innovation Initiative, the Emergency Plan for Education: 2009–12, and Maroc Numeric 2013), (ii) sectoral plans with embedded knowledge economy components (Plan Emergence, Plan Vert, Plan Halieutis, and Plan Azur), and (iii) regional plans that represent the extension of a previous plan to a specific area of the country (Plan Vert and Plan Halieutis for the Agadir region). Of these, Plan Azur is the only one for which results are available—the rest are too new to have generated reportable results.

Morocco’s plans constitute a framework for implementation of the knowledge-based economy that is original and so far unique in the region. The framework could be improved by making its knowledge economy dimension more explicit. The achievement of the framework will be its ultimate test.

By defining the vision and mission of knowledge-producing systems, Plan Emergence translates into concrete terms Morocco’s policy on innovation and entrepreneurial leadership. Six major sectors are covered: offshoreing, automobiles, aeronautics and space, electronics, textiles and leather, and agrofood. This 10-year industrial strategy is designed to boost the country’s gross domestic product (GDP) by 91 billion Moroccan dinars, create up to 440,000 jobs, reduce the trade deficit by 90 percent, and increase the country’s growth rate by an increment of 1.6 percent. It is also expected to help the country’s ailing export sector and encourage additional private investment of 50 billion dinars in manufacturing.

Plan Vert reorganizes agriculture producers within integrated structures to facilitate commercialization and exports. The program reflects the importance of agriculture in the Moroccan economy and to social stability. The plan includes a new land policy, improved management of water resources, and a package of fiscal incentives. The plan targets a sector that contributes 19 percent of Morocco’s gross national product (GNP)—15 percent from agriculture and 4 percent from agro-industry. The sector employs more than 4 million rural inhabitants and has created approximately 100,000 agro-industrial jobs, while providing food security for 30 million consumers. It is expected that this plan would create from 1 to 1.5 million jobs by 2020.

Plan Halieutis creates hubs for the transformation of regional fisheries transformation through the development of pelagic fisheries and high-value-added frozen products. The ultimate goal is to convert the fishing industry into a true economic growth factor by 2020 by doubling the sector’s value as a share of GDP and increasing employment from 61,650 currently to 115,000 direct jobs and 510,200 indirect jobs.

Plan Azur is an investment project part of the Vision 2010 that aimed to create six coastal resorts to attract 10 million tourists by 2010. But the plan was readjusted in 2007 due to the defect in reaching this goal. The new Plan Azur 2020 aims to capitalize on the lessons learnt from the previous plan and to create 470,000 new jobs, to double the number of tourists, and increase by 2 percentage points tourism’s share in the GDP by 2020.

The Maroc Innovation Initiative sets ambitious targets for patents and innovative startups, enhancing Morocco’s place as a site for research and development (R&D), particularly in biotechnology, information and communication technology, materials, nanosciences, and nanotechnologies. Policy priorities include innovation-based competitiveness, production of technology, exploitation of the R&D capacity of universities, and attracting talent to establish a culture of innovation and entrepreneurship. Other steps include creating innovation cities, collaborating with EU innovation programs, and raising R&D funding to as much as 2 percent of GDP by 2020, with 25 percent from private sources.


The people’s enthusiasm for that vision will rise or fall with the extent of their engagement in projects that they help to design and carry out. Its credibility will depend to a great degree on the success of the measures taken so far and of the plans now being implemented to diversify the economy. These must be closely monitored, particularly for their contributions to economic growth and job creation. In a similar vein, it is important to monitor the numerous initiatives undertaken around the country to create technoparks, competitiveness clusters, and so on.

Realizing the vision will be easier to the extent that decentralization is effectively implemented and further progress is made on governance. Of particular importance in this regard are the intensified campaign against corruption promised by the new government, an improved competitive climate (with better access to financing for small and medium-sized enterprises), greater transparency in public procurement, and advances in the digitization of Moroccan society, which presently is held back by high prices for telecommunications services, including Internet access, because of privileges enjoyed by the three incumbent operators.

Morocco needs to intensify the revamping of its education system by significantly improving the conditions of basic learning. Considerable efforts should be made at the primary and secondary levels through teacher training on a massive scale, improved pedagogy, better governance, and more rigorous evaluation. At the postsecondary level, some institutions of higher education have been granted limited autonomy, but they continue to suffer from overregulation. For example, the requirement that spending decisions be approved in advance makes it difficult for institutions to offer contracted research services, continuing education, and other services (as mentioned in chapter 6). Other obstacles block the development of private universities.

The research system, which presently is made up of various institutions (universities, public research centers, and the like)
working in silos, would require a more articulated policy. It would also benefit from improvements in the working conditions of researchers. Creating a new employment category for researchers would facilitate the recruitment of young scientists and rejuvenate the university system.

The shift to a knowledge-economy-based regime also requires actions to improve macroeconomic management of the economy. Greater fiscal space could be opened up by reducing subsidies for basic consumer goods (such subsidies now represent about 6 percent of Morocco’s gross national product, GNP), and loosening the convertibility of the dirham, which is closely pegged to the euro and the dollar (discouraging the competitive adjustment of the economy). Morocco should also pursue its efforts to create a larger trade union within the Arab Maghreb region, at a time when positive signs are emanating from several countries in the region.

**Tunisia**

Tunisia experienced rapid economic growth in the 1990s and 2000s. The annual growth rate for the two decades averaged almost 5 percent, placing Tunisia among the fastest-growing countries in the region, thanks to an efficient diversification of the economy (away from extractive industries and toward the textile, mechanical, and electrical industries), sound macroeconomic management, and trade openness toward Europe and other areas. Strong revenues enabled the government to invest heavily in social programs, infrastructure, and education.

Tunisia embraced the knowledge economy early on, incorporating it into its five-year plans and other planning processes. This has led to an important series of initiatives over the past decade, including the development of the tertiary education system (notably through the creation of postsecondary technological institutes known as ISETs), the modernization of industry (through the “Mise à niveau” program supported by the EU), the launch of numerous technoparks, and active, much publicized investment in ICTs and the Internet. (Tunis hosted the World Information Society Summit in 2005.)

While these are positive trends, the reality is that a distorted business environment and suboptimal governance conditions designed to benefit the ruling power and its networks curtailed growth and frustrated the population. Rising unemployment, particularly among recent graduates, led to the explosion that sparked the Arab Spring. To a certain extent, Tunisia fell victim to an incomplete shift to the knowledge economy, since the political unrest was ignited by educated but unemployed young people and propagated by the Internet and social media.

Since the fall of the administration of Zine El Abidine Ben Ali in early 2011, Tunisia has embarked on an orderly and democratic transition. But it has been painful, with the economy experiencing slower growth because of decreased tourism, for example. The government has also had to increase welfare spending and introduce schemes to create jobs in social and public activities. As a consequence, large budget deficits have appeared, while exchange reserves have plummeted. In this context, while knowledge and innovation remain in Tunisia’s development plans, they have not been high priorities.

Job creation, particularly for educated youth, remains the single most important challenge. In a population of 10.5 million, 800,000 people are seeking employment, among them 180,000 recent graduates.

An urgent task is to improve the business environment by amending the regulatory and legal framework inherited from the past regime, which includes policies and practices that are not conducive to a thriving knowledge economy, such as tolerance for monopolies, cumbersome authorization processes, and unnecessarily centralized procedures, among others. The situation calls for a nationwide audit of administrative and legal procedures and the early implementation of needed reforms with the participation of the business community and civil society.

Another series of measures concerns the education and training system. To meet the needs of the economy it is imperative to improve and adjust curricula, notably in postsecondary technical education and in the vocational system. The involvement of the business sector, including foreign firms, is a necessary part of this effort. Technical and other training linked directly to measures to support job creation in the public or social sector—and in the informal sector—would also be useful.

The digitization of the economy should be accelerated. The development of e-services could create jobs for technically educated youth. Offshoring provides a promising avenue for job creation, as do creative industries (see chapter 8).

A major effort for to create physical, manufacturing, and education infrastructure is needed in depleted areas in the center of the country, where unemployment is rampant. The benefits of such investments will be felt only in the long term; therefore, they must be well calibrated.

The commitment of Tunisian society to this development path depends largely on the capacity of the new government to seize the opportunity to carry out needed reforms without bowing to short-term demands, client requests, or conservative ideological biases (which may create a climate of fear or distrust in a society that had been in many respects the most open in the Arab world, notably with regard to the status of women). The role played by the international community—particularly multilateral organizations and donors—in sustaining the change process, including actions related to the knowledge economy, will be crucial.

To sum up, significant adjustment is needed in a society that is experiencing dramatic change, even if it has been so far remarkably controlled. The key is to find a way for actions related to the knowledge economy to receive the attention they need in the face of competing demands from a young and frustrated population that expects quick change, with a new

3. See, for example, the reports on Tunisia’s knowledge economy issued by the Institut d’Economie Quantitative in Tunis (IEQ 2007, 2009, and 2011).
4. For the support provided by the World Bank, and information on other donors’ support, see World Bank (2012c).
The Tunisian media in transition

The change brought about by the Jasmine revolution has created a new situation for the media, which now enjoy freedom of expression to an extent not experienced for decades. But making use of that freedom has not been simple or straightforward.

The system of media control enforced by the Ben Ali regime transformed the country’s journalists into mere communicators of government policy. Since the revolution, Tunisians have witnessed a flowering of new media operating as platforms for personal and political expression and of investigative journalism, while the established newspapers and TV and radio channels have searched for new, open forms of information. The government, for its part, established a National Authority for the Reform of Information and Communication (INRIC).

But political and ideological maneuvering has affected the transition process. The Tunisian mainstream media have become embroiled in the political struggle between the new government, led by moderate Islamists, and the secular opposition. The opportunity for local journalists to become more professional may be sacrificed yet again to ideology, especially since working conditions remain poor. The liberalization process has been delayed, as actions of repression and intimidation, including jail sentences, continue to affect journalists, particularly when they broach sensitive issues such as religion and the status of women. Journalists and their editors must still make calculations about the limits of freedom of expression. The situation probably will not be settled soon, but it is a litmus test of the maturity of Tunisian democracy.

Source: El-Issawi 2012.

Jordan

Jordan took its first steps toward the knowledge economy nearly a decade ago. A national agenda prepared in 2004 charted a three-step path: (i) from 2004 to 2009, actions on fundamentals in education, the business environment, and other areas; (ii) from 2009 to 2015, development of a competitive manufacturing base; and (iii) after 2015, the take-off into knowledge-economy-based development. Various factors interfered with the achievement of those plans, the foremost being the difficult geopolitical environment in which the country has found itself. The relative instability of the government is another complicating factor. There have been frequent changes of ministers, including the prime minister, in a context of demands for more rapid democratization and greater popular participation. The institutional landscape features a puzzling accumulation of overlapping agencies and departments, some of which may be likened to fiefdoms that duplicate effort and impede reform. In this context, the business environment suffers from significant drawbacks, including high taxes, selective application of the law, inefficient regulatory measures, and so on. This has affected inflows of FDI, which remains modest with respect to local investments and as a share of GDP. A law to attract foreign investment that has been in preparation for several years is still awaiting implementation. The global economic crisis has, not surprisingly, slowed the country’s economy.

On the education front, Jordan benefits from a high literacy rate (more than 85 percent of the population are literate). But, as in other Arab countries, the system fails to equip students with the skills demanded in the market, including soft skills such as problem solving, teamwork, and leadership. The government has introduced wide-ranging reforms to build skills for the knowledge economy. The Education Reform for the Knowledge Economy project, for example (see chapter 5), was launched almost 10 years ago at the primary and secondary levels to prepare students for the knowledge economy, in line with the long-term plan evoked above. This project and related reforms should soon begin to bear fruit, making Jordan’s workforce more attuned to the needs of the productive economy.

Compared with other countries in the region, a sizeable chunk of Jordan’s labor force works in science and technology (S&T). The country’s R&D infrastructure is solid and its scientific production relatively high. But these S&T capabilities are not closely linked to the needs of the economy and society, which is all the more regrettable because the country has a significant entrepreneurial class with excellent innovative potential. The perpetuation of traditional S&T policy structures and approaches, the conflation of innovation policy with S&T policy, and the reduction of innovation to the application of research are all part of the problem.

Exploiting the potential for innovation can give a significant boost to development. To create a more dynamic innovation system and to begin to change the mind-set of Jordan’s policy makers, a recent World Bank mission proposed a series of actions, beginning with the establishment of an interministerial innovation body, as in Finland. Accordingly, a National

5. This section also draws on World Bank (2012a).
Annex 3. A country application of the knowledge economy model

Innovation and Competitiveness Council has been established as a first step, accompanied by campaigns to mobilize concerned communities, notably youth, and by sectoral audits to unearth innovative and promising opportunities that could profitably be scaled up.

Some sectors also present attractive prospects for job creation. ICT-based industries such as business process outsourcing (BPO) and call centers, areas in which Jordan has a comparative advantage owing to the widespread use of English and a history of links with American and other foreign investors. Another promising sector is health tourism, in which Jordan has already invested heavily: the kingdom now enjoys a solid hospital infrastructure. There is a need, however, to raise the skills of nurses and intermediary medical workers, which could help fill several thousand jobs. Finally, the water sector is a source of massive technical and industrial effort, along with appropriate institutional arrangements, in view of water’s vital importance for the country.

Egypt

Egypt is experiencing serious problems in its political transition, having been plagued by tensions between various groups and parties with strongly diverging views of the proper development path. Ideas aside, the capabilities of the government to engineer major reforms are limited. Early in the past decade, Egypt enjoyed relatively high growth, thanks to significant reforms of its business environment that earned it a spot among the top reformers in the World Bank’s Doing Business surveys in the late 2000s. Those reforms helped to attract waves of FDI, particularly in the ICT sector. But the benefits of these positive trends were for the most part captured by the cronies of the Mubarak regime, contributing to the uprising that erupted in early 2011, in the wake of Tunisia’s Jasmine revolution.

Policy instability, bureaucracy, and corruption, as well as restrictive labor regulations and skill shortages are major obstacles to the development of the country, and, particularly, to the cultivation and exploitation of knowledge and innovation. But pockets of dynamism can be found in industry (in the telecommunications sector, for example), in the universities (in the form of entrepreneurial teams), and even in government, where various bodies have been able to engineer efficient innovation programs. Building on these dynamic spots would improve the climate for broader reforms. Some reforms and programs, once put in place, could take advantage of the country’s S&T system, which has some useful assets in the form of R&D capabilities and a cadre of scientists and researchers who could be recruited to work on projects with high value added.

Building on programs and policies that have already demonstrated their efficiency and utility, a number of measures could be implemented without further ado. Most of these would not have an immediate effect in terms of new activities and jobs, but they would, at least, show that a significant community of innovators, academics, scientists, and business people, supported by capable civil servants, was fully and seriously engaged in developing the country. Such policy measures might include (i) the design of a focused, but comprehensive, innovation and S&T plan; (ii) a program to streamline the public research sector, which is cluttered with underfunded research laboratories and teams; (iii) a refocusing of technology transfer offices, presently devoted entirely to foreign technologies, on domestic assets; (iv) closer links between the universities and the economy and society, through incentives for teachers and researchers; (v) innovation- and management-oriented programs for students; (vi) incentives for graduates to perform work on local and regional needs; (vii) the adaptation of technical and vocational schools to respond better to the demands of employers; and (viii) the development of a culture of evaluation within government departments responsible for innovation, research, and education.

Several strong sectors can be strengthened for the good of the economy as a whole through well-targeted actions—among them BPO and information technology (IT) outsourcing, offshoring, and food processing. Second, in the interest of soothing social tensions and improving social cohesion, inequalities in access to higher education should be addressed by harmonizing conditions of access to both public and private universities. Finally, the media should be invited to showcase success stories with a view to changing mind-sets and setting in motion a positive dynamic toward change and renewal.

Lebanon

Lebanon’s government currently has very limited capacity to act. But the country benefits from a relatively good climate for innovation, both institutional and technological. A relatively large contingent of change agents active in various spheres of Lebanon’s society and economy have the ability to turn ideas into competitive enterprises, effective technoparks, and agile venture capital organizations. Local and municipal authorities also play a very active role in a context where the central power lacks room to maneuver. The country also benefits from an impressive diaspora.

Under such circumstances, the best policy is to facilitate initiatives taken by civil society, to ensure that they unfold under conditions of transparency, and that success stories are widely publicized. In taking these steps, the government would contribute, along with Lebanon’s community of change agents, to a climate of self-confidence and trust, thereby preparing the ground for further and deeper reforms when the time is ripe.

In this context, the World Bank is launching a project to support the provision of $30 million in venture capital and seed funding through Kafalat (see chapter 6, World Bank 2012b). This effort should help to strengthen the innovative and entrepreneurial dynamism of the Lebanese economy.

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6. These policy measures and supporting analysis are developed by Dubarle (2012) in an internal note prepared for the European Investment Bank (EIB) on obstacles to collaboration between the academic and business sectors. Egypt is one of several case studies in Dubarle’s analysis.
Algeria presents features of both the oil-rich countries and the southern Mediterranean countries. Influenced by the pro-democracy stirrings of the latter, it is also ensnared by the “resource curse” associated with wealth from oil and gas, which helps maintain the status quo and permits inertia on many fronts. But Algeria has tremendous opportunities to diversify its economy beyond oil and gas, beginning with the agrifood sector and continuing with chemicals and pharmaceuticals. Tourism also offers opportunities, once safety and security can be assured. The building and construction industry could open up huge markets for innovation and jobs (and not only low-skilled jobs) through public procurement. Investments and initiatives launched since mid-2000 include the establishment of an innovation agency (ANDRAVET), the building of technoparks (such as Sidi Abdallah), and various reforms and projects related to the ICT sector. The impact of those measures on job creation, however, has been modest.

The underlying question seems to be the capacity of Algerian society to engage in effective collective action. Some efforts have been made by the Conseil National Economique et Social, with World Bank support, to stimulate a collective dialogue on the knowledge economy model, with a series of public gatherings of high officials and influential policy makers. These meetings were held in Algiers in 2006 and 2008, with support from the World Bank Institute’s Knowledge for Development (K4D) Program. It is common to all of the GCC countries. The alternative model helps maintain the status quo and permits inertia on many fronts. But several Gulf countries face problems of leadership succession, with attendant political uncertainties. They also face social challenges related to their conservative traditions, notably with respect to the status of women.

The Nabni 2012 initiative: 100 measures for a new Algeria

Nabni is a participative Web-based think tank created in April 2011 to prepare an action plan for a new Algeria released on July 5, 2012, marking the 50th anniversary of the former colony’s independence from France. Nabni is nurtured by dozens of members of Algerian civil society, including members of the Algerian diaspora.

They have come up with 100 measures, implementable in the short term, aimed at improving the daily life of citizens, restoring trust, and preparing for the future. The measures cover a diverse set of themes: access to public services, health and social development, living conditions for students and young people, enterprise and employment, access to finance, access to housing, land management, education and research, infrastructure, and governance and reform.

More than half of the proposed measures relate directly to the pillars of the knowledge economy: simplifying the process of starting a business, reducing bureaucratic hurdles, providing stipends for students to facilitate mobility and internships, rewarding excellence in research, granting four mobile 3G licenses, establishing free access to government information, and so on. A brief fact sheet is available for each of the 100 proposed measures, including the rationale for the measure, details on key points, and identification of the government institutions best positioned to implement the measures.


7. These meetings were held in Algiers in 2006 and 2008, with support from the World Bank Institute’s Knowledge for Development (K4D) Program.

8. This section is based on Andersson and Djeflat (2013).
world’s industrial leaders and to become global leaders in advanced service sectors such as finance, media, and tourism. Constrained by limited indigenous talent in entrepreneurship and management, some countries, notably Qatar and Saudi Arabia, have attempted to jumpstart their diversification efforts by attracting foreign firms and multinationals through powerful incentives and first-class telecommunications, housing, and transportation infrastructure. They have also made huge investments in universities and research centers, and have made significant improvements in their business environment.\(^9\)

In the countries of the Gulf that are mostly desert, cities are central to growth and diversification. Most of these countries have therefore invested heavily in urban development. They now need to develop creative strategies that will enable them to make the most of their investments by developing a vibrant climate for innovation that will make them competitive with other global hot spots in finance, media, and education. Despite substantial reforms and excellent facilities designed to attract global firms, defects in the business environment persist (table A3.2).

Key issues include bureaucratic hurdles, labor-market rigidities, and an inadequately trained indigenous workforce. Education systems continue to present serious weaknesses in their ability to impart basic skills, particularly in technical and vocational training. Despite being twinned with top foreign counterparts, universities in the GCC countries have yet to build strong R&D capabilities. In addition, some countries (particularly Saudi Arabia) present serious difficulties related to contract enforcement and poor judiciary systems.

The diversification model of the small Gulf states—pioneered by resource-poor Dubai—is based on partnering with foreign firms, academic institutions, and other entities to build hot spots of global innovation in rising sectors through an aggressive policy of incentives and infrastructure. The approach has borne some fruit. But when approaching the frontier of a competitive sector, as Dubai has approached finance, success is by no means assured. For one thing, speculation tends to infect and undermine the rapid real-estate growth that is inherent in the model. The building of world-class educational institutions and research centers, as pursued by Dubai, Abu Dhabi, and Qatar, is a long-term journey that requires sustained efforts and investment. A key issue is the national capacity to administer reforms at a time when the handling of key management responsibilities has been handed over mainly to expatriates, as discussed above.

The GCC countries also confront the problem of finding the right balance between nationals and expatriates in the management of their economy. Some—notably Qatar, the United Arab Emirates (UAE), and Saudi Arabia—have chosen to employ large numbers of high-level expatriates to manage firms (including state-owned enterprises) and government agencies responsible for economic development, leaving only strategic and political decisions to the nationals. This policy has had the advantage of facilitating a rapid take-off of new sectors and activities, but has also raised questions about the long-term capabilities of the countries to manage and direct their development process, which requires efficient handling of relations with global firms that are key to the sustainability of the economic model. In addition, relying too much on foreign workers, especially at the top, diminishes job opportunities for nationals, particularly those with the postsecondary diplomas that are now issued in great numbers by the top universities in the region.

Qatar and Saudi Arabia are among the countries that have adopted policies in recent years to increase the number of nationals in their recruitment processes, a trend that affects both highly educated people and those with intermediate skills. Other countries, notably Oman and Bahrain, have been more inclined to rely on domestic talent, which may have delayed their take-off but may make them more resilient and sustainable in the long term. Relying on home-grown skills also entails difficulties. Locals receive salaries that are much higher than those paid to similarly qualified expatriates for similar work. Those salary differences are imposed on private companies, both domestic and foreign, which must meet quotas for the recruitment of locals. These practices seriously distort the labor markets. The question of developing cadres of managers and decision makers from the domestic population will be solved only through deliberate measures to cultivate public and private sector expertise through advanced training programs, dedicated schools of public administration and management, and other actions.

\[\text{TABLE A3.2} \quad \text{Obstacles to doing business in the Gulf countries (late 2000s)}\]

<table>
<thead>
<tr>
<th></th>
<th>Most important</th>
<th>Second-most important</th>
<th>Third-most important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>Poor work ethic</td>
<td>Restrictive labor regulations</td>
<td>Inadequately educated workforce</td>
</tr>
<tr>
<td>Kuwait</td>
<td>Inefficient government bureaucracy</td>
<td>Inadequately educated work force</td>
<td>Political instability</td>
</tr>
<tr>
<td>Qatar</td>
<td>Inflation</td>
<td>Restrictive labor regulations</td>
<td>Inadequately supply of labor</td>
</tr>
<tr>
<td>Oman</td>
<td>Restrictive labor regulations</td>
<td>Access to financing</td>
<td>Inadequately educated workforce</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>Inefficient government bureaucracy</td>
<td>Inadequately educated work force</td>
<td>Restrictive labor regulations</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>Inflation</td>
<td>Inadequately educated workforce</td>
<td>Restrictive labor regulations</td>
</tr>
</tbody>
</table>


\(^9\) For an in-depth analysis of the approach taken by the Gulf countries to the knowledge economy, along with related issues and prospects, see Ewers and Malecki (2010).
The annex continues with a closer look at the situation of Saudi Arabia, in view of its importance in the region, the size of its economy, and its high level of unemployment. Some additional comments are then offered on Oman, which presents some interesting political and societal features. A few words will be added about the region’s fragile states, which could also benefit from innovation-based development.

**Saudi Arabia**

Saudi Arabia faces the considerable challenges of maintaining its status as a regional power while also preserving stability at home by providing jobs to a large contingent of educated youth. Its overall development strategy, pursued for the past decade or so, has been largely based on a knowledge economy approach. The chief components of that approach include:

- The continued development of King Abdul-Aziz City for Science and Technology (established in the 1980s), which has expanded research centers and programs in many areas (for example, water, oil and gas, petrochemicals, biotechnology and genetic engineering, aviation and space, nanotechnologies)
- A massive program of new cities (chapter 6) and the creation of technology and industrial zones (notably an ICT park in Riyadh)
- The building of first-class science and technology universities (King Abdullah University of Science and Technology)
- Education programs specifically focused on talented youth (for example, The Foundation for Giftedness and Creativity)
- The development of numerous libraries, Web sites, databases, and the King Abdullah Initiative for Arabic Content
- Yesser, an e-government electronic transaction program (chapter 7)

These initiatives have come together with a series of reforms to improve the business environment and an aggressive policy of attracting foreign investors managed by SAGIA, a powerful agency that is also responsible for building the new cities. In addition, important steps have been taken to promote girls’ education by offering them opportunities equal to those offered to boys. This is a clear move toward a new social contract and a positive sign of the modernization of Saudi Arabia’s economy and society.

The rigidity of the labor market and the strong preference of Saudis for secure jobs in the public sector affect the development and functioning of the Saudi economy, and particularly its readiness for the knowledge economy. The draw of the public sector skews the allocation of human resources, while a sense of entitlement and complacency, or at least a lack of motivation, among public employees saps the efficiency of the administration in the implementation of policy. Public employees lack incentives for ambitious implementation of the government’s plans, including those related to knowledge and innovation, which demand drive and creativity. Measures to provide the necessary incentives should be put in place. Introduction of a national social security system may be an important step, as it would reduce the urgency of the search for security and the consequent attractiveness of the public sector over the private sector.

Considering the scope of its plans and challenges, the kingdom should ensure that its knowledge and innovation agenda includes a strong policy of technical and vocational education and training (TVET) and an active innovation policy. The TVET policy requires a set of complementary actions: (i) an upgraded vocational guidance service to encourage secondary-school graduates to enter the TVET system and become mid- and upper-level technicians; (ii) an expanded program of apprenticeships and other schemes that link work with training throughout the TVET system; (iii) the development of modular competency-based training schemes; and (iv) the granting of substantial autonomy to TVET centers so that they can respond quickly to evolving demands and opportunities. The country’s innovation policy should be multifunctional in the sense that all of the sources of innovation detailed in table A3.3 are explored and pursued. So far none of these roads has been systematically explored. Detailed plans should be prepared to exploit the potential opportunities offered by each of these roads.

**TABLE A3.3 Four roads to innovation for Saudi Arabia**

<table>
<thead>
<tr>
<th>Incubation</th>
<th>Acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incubating potential ventures and building innovative prototypes that could become successful products in international markets. This requires support for entrepreneurship through national awards and scholarships programs to develop an innovative culture and an entrepreneurial spirit.</td>
<td>Acquiring corporate ventures through capital investment, venture capital partnerships, mergers, and acquisitions. This requires entering global value chains, through foreign direct investment, to encourage application-oriented research and development and to stimulate upgrades of technical skills.</td>
</tr>
<tr>
<td>Incremental improvement</td>
<td>Research</td>
</tr>
<tr>
<td>Improving existing products by adding new features and value-added services. This requires multi-industry support mechanisms to help Saudi industrialists make minor innovations that can generate big rewards.</td>
<td>Promoting Saudi research and innovation through regional and national funding and through the private efforts of Saudi industries. Well-funded public-private partnerships are required to stimulate collaborative research between Saudi (and foreign) firms and research centers, focusing on the seed stage.</td>
</tr>
</tbody>
</table>

Source: Adapted from Chebbo (2008).

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10. The research road is a possible exception, with the establishment of numerous research organizations and centers of excellence. These appear to be paying off, since the kingdom occupies a prominent place among Arab countries in scientific publications and patents. Between 1996 and 2006, the number of scientific papers published by or with the participation of researchers residing in Saudi Arabia was 26,854, the 2nd-highest in the Arab world and the 48th worldwide.
Oman

The case of Oman, a quite open society, illustrates many of the questions facing countries that have moved gradually toward a knowledge economy model. Oman has achieved high economic growth over an extended period, with GDP gaining 5.5 percent in 2011, a stable macro economy with modest inflation (3.7 percent in 2011), and a significant trade surplus (33 percent of GDP). At the same time, the country has a relatively equal distribution of wealth, a stable society, no major ethnic or religious conflicts, and a low crime rate.

The Arab Spring did not bypass Oman. The leadership reacted promptly to turbulent demonstrations by taking a series of strong measures that revealed a spirit of openness and dialogue in the face of social and political demands, including a reshuffling of the government. Probably most important for the long-term sustainability of the country are the genuine strengths of the Omani development model. Although Oman has much less oil and gas than the UAE or Qatar, and also a lower level of income, it is fair to say that the country now offers a unique policy model within the Arab world that could serve as a source of inspiration for others outside the Gulf, both for its unique features and for the results it has produced.

In its educational policy, public communications, and foreign policy, the regime has consistently stressed shared values, tolerance, openness, and sustainable development. Traditional architecture prevails. The Omani people have a unique historical legacy, being the only Arab country with a historical presence in both Asia and Africa. A pro-employment policy, access to landownership, affordable consumer goods, and universal health and education services provide good living conditions. A research council has been created under a policy to promote research and innovation.

For all its virtues, however, the Omani model also meets with stark challenges. Some of these are traceable to the fact that the country joined the modern world just 40 years ago, and its human resource base is still thin. Other problems stem from prevailing incentives and the way institutions operate. In short:

- **Power remains centralized.** While the sultan is a respected and unifying force, political parties are absent, and the new legislative role of the consultative assembly is still unclear.
- **Mechanisms for horizontal collaboration across vertical hierarchies are undeveloped.** The lack of a full-time prime minister means that line ministries are overly independent and tend to pursue their own agendas. A culture favoring consensus decisions and a fear of making mistakes discourage officials from taking on cross-cutting issues that are relevant to multiple authorities.

- **Jobs have been created at the expense of productivity and competitiveness.** Operating partly through a quota system, the policy of “Omanization” favors locals in the workplace but exacerbates skill shortages and lowers productivity.
- **Oman’s environmental record is poor.** Oman’s carbon footprint is among the largest in the world. Consumer subsidies and top-down policy making mean that consumption of water and energy is highly inefficient. Agricultural activities destroy groundwater and contribute to rapid soil erosion and loss of biodiversity. The number of private cars has exploded, while public transport is sorely lacking.
- **Omani society lacks a research culture and has yet to embrace experimentation, risk-taking, innovation, and entrepreneurship. The universities lack autonomy.** Despite the creation of open research grants and the development of a research and innovation policy, government policies remain heavy-handed and bureaucratic, generating red tape and micromanagement. Government is still viewed as the performer rather than the enabler.

Like other countries in the Middle East, Oman has a young population, a third of whom are under 16. They are rapidly becoming well educated but face a looming shortage of attractive job opportunities. Given high incomes and living costs, high dependency on dwindling oil reserves, and strong dominance by the public sector, Oman must find a way to nurture new industries, products, and firms. Outstanding social and environmental issues could profitably be turned into a pull factor for research, technical advance, innovation, and enterprise development.

Fragile states

This bird’s-eye view ends with a few words on fragile states—Iraq, Libya, Syria, and Yemen—all of which fall into the resource-rich category. Actions should be calibrated to what is feasible, while not neglecting pockets of competence that exist in the society, comparative advantages (including oil and gas resources, mining, but also agriculture in Iraq and Syria), and opportunities created during reconstruction processes. A few principles are worth stating:

- **Do not be overambitious,** but take advantage of easy wins to rebuild people’s self-confidence through job creation and reliable delivery of basic goods and services.
- **Build on specific groups** within universities, firms, government institutions, and communities that are highly motivated and are benefiting from foreign support to ensure a modicum of continuity over the next few years.

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11. This section is based on Andersson (2012).

12. Although the turmoil was short-lived, its repercussions were not. In the weeks and months that followed the demonstrations, the sultanate went through dramatic changes at a pace hardly seen since Sultan Qaboos bin Sa’id united the country 40 years ago. The sultan reshuffled his cabinet, replacing more than half his ministers over a brief period. He closed the powerful but unpopular Ministry of National Economy, created 50,000 new public sector jobs, ordered new funding for education, and raised minimum wages and unemployment benefits, among other measures. On governance, he instituted a system by which citizens could submit complaints and promised to heed their suggestions.
Annex 3. A country application of the knowledge economy model

• Make good use of resources from oil and gas exploitation, placing them in dedicated funds to support innovation and enterprise creation as well as social development and the satisfaction of basic needs.
• Take advantage of reconstruction processes to promote the use of new technologies and to provide workers with technical training.
• Build capabilities within government at the central and local levels in budget management, organizational planning, and democratic and participatory processes.
• Embrace good governance, transparency, and the fight against corruption.

Such approaches, and the multiplication of successful initiatives that embody them, foster an overall climate of change and reconstruction, a self-reinforcing climate imbued with trust and self-confidence that, like a single drop of oil, can spread gradually across the nation.

Conclusion

Many Arab countries face similar challenges, and many different paths are open to them to address those challenges. All of those paths pass through decisive institutional reforms and economic diversification. That said, a distinction must be made between the resource-rich and the resource-poor countries. Resource wealth is a double-edged sword. It has allowed some countries to make bold investments designed to achieve dramatic gains in the economic and industrial arena. But it also reduces the pressure to carry out reforms that ultimately must be made and allows countries to delay their transition to a knowledge- and innovation-based development model. The fact remains that, starting from the initial conditions in which countries find themselves (as sketched out at the beginning of this annex), all manner of trajectories can be envisaged. The factors that determine the choice of trajectory will be the political economy of change that characterizes each country; the change in mind-set that is needed to overcome the status quo and to embrace bold, creative visions and strategies; and the way those strategies interact with other forces and ongoing political changes.

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The imperative of creating millions of good jobs is the first of many daunting challenges confronting the Arab world. To meet those challenges, Arab countries would do well to embrace a model of economic growth based on knowledge and innovation, building on the global move toward the knowledge economy.

Over the past decade, some countries of the region have spurred growth and improved their global competitiveness by taking the first steps in the direction of the knowledge economy. To go further, however, Arab societies must deepen their commitment to reforms in four key policy areas: developing more open and entrepreneurial economies, preparing a better-educated and more highly skilled population, improving their capabilities for innovation and research, and expanding information and communication technologies and their applications. The success of a knowledge-economy strategy depends on coordinated progress on all four fronts, with bold approaches tailored to each country’s challenges and opportunities.

Recent events in the Arab world have affirmed the need for greater opportunity and dignity for all. Governments across the region are grappling with the challenge of job creation, especially jobs for youth and women. Transforming Arab Economies: Traveling the Knowledge and Innovation Road provides countries of the Arab world with a new approach to development strategies that can help them achieve sustainable growth and create jobs—both key for ensuring social and economic inclusion. This work speaks directly to those in government, business, and civil society across the Arab world who are keen to work in new and different ways, using knowledge, innovation, and technology as key drivers to shape a more inclusive growth path and a better tomorrow.”

Inger Andersen, Vice President, Middle East and North Africa, World Bank

“CMI is to be congratulated on producing this daring and timely work. Envisioning the future is a bold step and a major challenge at a time when the protagonists of the Arab revolutions are so preoccupied with the present. The creation of wealth and jobs will require considerable changes in the political arena toward greater democracy, a more resolute search for social justice through more inclusive policies, and a new departure toward the knowledge economy at the economic level. Given the diversity of the countries of the Arab world, the knowledge economy will have the best chance of taking hold if the complementarities between the Gulf states and the countries of the Maghreb and the Mashreq are carefully exploited. This important work deserves to be widely discussed within the halls of government in the Arab world.”

Rachid Benmokhtar Benabdallah, President of the National Observatory of Human Development and member of the Academy of Science and Technology, Morocco

“Transforming Arab Economies not only makes a powerful and compelling case for the adoption of a knowledge- and innovation-driven growth scenario for the Arab World, it also underlines the importance of a clear vision to drive the deep reforms needed to make it happen, reforms that cut across sectorial and ministerial silos. Such a vision should ensure that reforms are pursued in a participatory fashion that guarantees broad-based support for implementation. The report also highlights the idea of ‘growth spots’ that would facilitate the adoption of the new economic model. This timely and very important report from the World Bank should be required reading for all decision makers and concerned citizens in the Arab world. Our future is being shaped right now by the actions we take to bend the future to our dreams.”

Ismail Serageldin, Librarian of Alexandria, Director of the Bibliotheca Alexandrina, and former World Bank vice president