

The Knowledge Economy and Mediterranean Countries: Challenges and Opportunities

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This article presents the developing knowledge economies in the Mediterranean area. The importance of the concept for growth and employment in the region is treated in a first section. In a second section, benchmarking elements, based on the World Bank's Knowledge Assessment Methodology, are presented. Significant Knowledge Economy initiatives at the national level are then detailed. Brief considerations on the importance of international cooperation in Knowledge Economy matters then conclude the paper.

The Challenges of the Mediterranean Region

The Mediterranean region was a source of global knowledge, innovation and modernization at the beginning of the last millennium. Left behind by the Industrial Revolution, the region's socio-economic situation gradually worsened. Recent evolutions, although in some parts encouraging, still leave this region behind many others in the world in terms of development and growth, and new challenges are emerging. Furthermore the Mediterranean countries as a whole have entered a vast period of demographic, political, economic, social and cultural transition marked by a profound process of mutation which raises many important challenges.

Perhaps the greatest single issue facing the economies of the Mediterranean Region is the challenge of employing its people in good jobs to absorb rapidly growing populations. Meeting this challenge is neither simple, nor should it be postponed. While the region is heterogeneous in terms of developments in the labor market, the majority of the region has been characterized by high levels of unemployment, and in some cases by declining real wages as well. The problem of job creation for the Middle-East and North Africa (MENA) region² is staggering. Some 47 million jobs need to be created over the next 10 years just to keep pace with new entrants to the job market (ILO). Close to 6.5 million additional jobs would be needed to reduce the regional unemployment rate by one half (World Bank). The implication is that the current employed workforce would have to expand by close to 60% over the next ten years. Such an accomplishment was not even achieved by the high performing East Asian economies during the height of their employment growth periods.

Another increasingly important challenge faced by the Mediterranean countries is increasing global competition. China and India are obvious examples of emerging countries that are contributing to a strong external shock for Mediterranean producers. These "continent-countries" are more and more influential in the types of industrial activities where international specializations have been developed by many Mediterranean countries, textiles, leather and clothing, as well as ICT and software development. Furthermore, this competition will become increasingly acute as the world economy accelerates its integration process. The need to raise competitiveness becomes a major challenge for emerging countries.

¹ The findings, interpretations, and conclusions expressed in this article do not necessarily reflect the views of the Executive Directors of The World Bank or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work.

² The countries included in the World Bank's MENA classification are: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates, West Bank and Gaza and Yemen.

In view of these challenges and in this context, there is a clear need for a new form of economic development.

Knowledge Economy for Mediterranean Countries

Knowledge makes the difference at all levels of development. When knowledge is put to work to accelerate and deepen the development process, and applied to all types of innovation, including the more modest ones in the form of basic technology diffusion, it becomes a major resource for generating wealth and jobs (see Graphic 1, which compares growth trends between Korea and Ghana and highlights the differences due to knowledge).

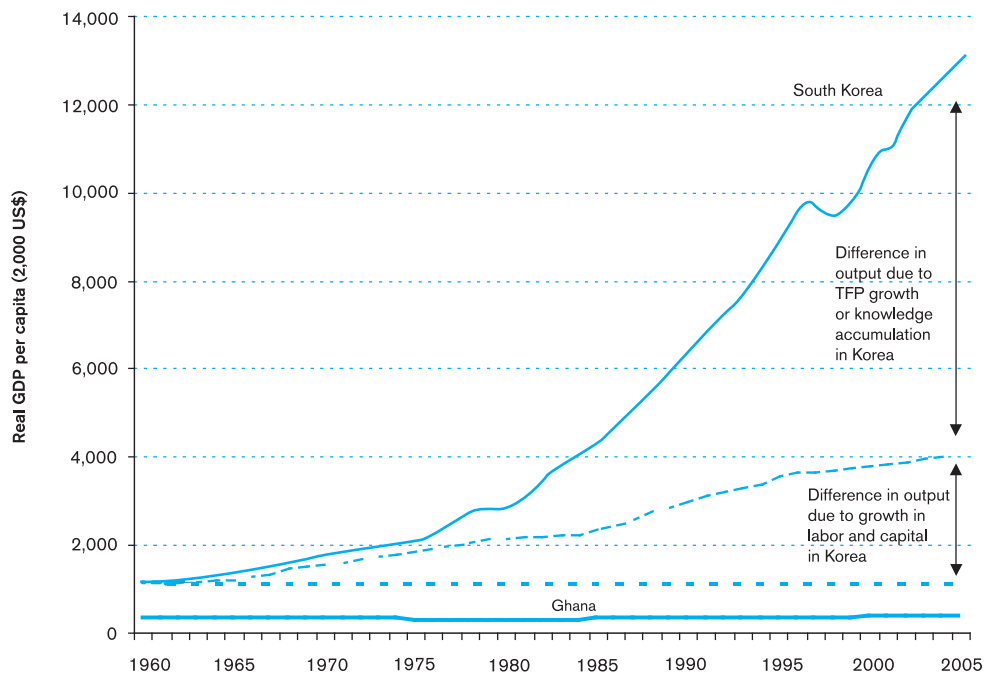
A new economic development model based on knowledge - its creation, dissemination, adaptation, and transformation into the productive sector - has emerged. The central role of knowledge in economic growth is widely acknowledged in advanced countries and the experience of those that have championed this new paradigm has led to the coining of the expression "Knowledge Economies" (KEs).

A Knowledge Economy, as defined by the World Bank Institute's Knowledge for Development Program, relies on four distinct pillars: 1. *An educated and skilled labor force* able to continuously upgrade and adapt their

skills to create and use knowledge efficiently. Education and training systems encompass basic (primary and secondary) education, vocational training, higher education and lifelong learning; 2. *A modern and adequate information infrastructure* to facilitate the effective communication, dissemination, and processing of information and knowledge. ICT constitute the infrastructure of the global, information-based economies of our time; 3. *An effective innovation system* of firms, research centers, universities, consultants, and other organizations able to keep up with new knowledge and technology, tap into the growing stock of global knowledge, and assimilate and adapt it to local needs; and 4. *An economic incentive and institutional regime* that allows for the efficient mobilization and allocation of resources, stimulates entrepreneurship and offers incentives for the efficient creation, dissemination and use of existing knowledge.

Mediterranean countries need to take advantage of this new source of growth and employment. To date, related investments in education, information infrastructure, research and development (R&D) and innovation have been insufficient or inappropriate in most Mediterranean countries. Moreover, inadequate economic and institutional frameworks can prevent these investments from yielding desired results. Mediterranean countries therefore risk falling further behind in the world economy. Action is needed to

GRAPHIC 1 The Importance of Knowledge for Growth and the Creation of Wealth



advance reform and intensity and adapt knowledge-related investments, especially in view of the particular challenges faced by many Mediterranean countries.

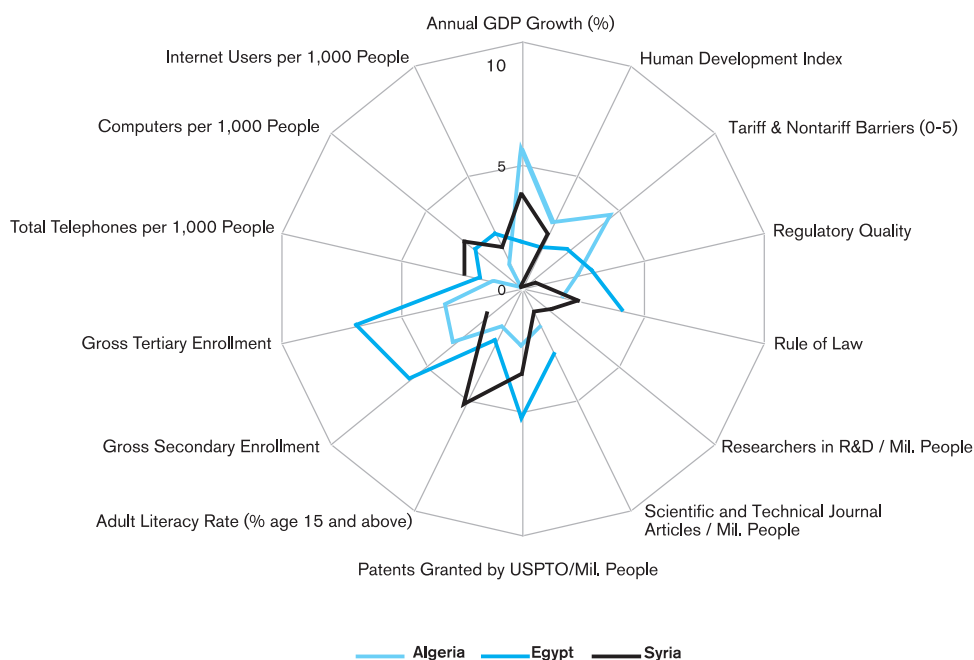
Benchmarking the Mediterranean Region on the Knowledge Economy

A good overview of the current situation of the Mediterranean countries can be gleaned through the Knowledge Assessment Methodology (KAM). The Knowledge for Development (K4D) program at the World Bank Institute has developed a database and a set of indexes to measure countries' progress on the four KE pillars. The KAM (www.worldbank.org/kam) is a Web-based tool that offers a holistic view of the wide spectrum of factors relevant to the knowledge economy. It also provides a basic assessment of countries' and regions' *readiness* for the knowledge economy (not its performance). Based on the four-pillar framework, it is designed to help countries understand their strengths and weaknesses by comparing their performance over time and their performance relative to other countries. The KAM allows policy makers to pinpoint their country's problems and opportunities, revealing areas where policy attention or investments may be required to make the transition to a knowledge economy.

Comparisons in the KAM are made on the basis of 80 structural and qualitative variables that serve as proxies for the four KE pillars. Because the variables are of different intervals and scales, all are normalized on an ordinal scale from 0 (weakest) to 10 (strongest). Currently, the KAM covers 128 countries and 9 regional groupings. The comparisons are presented on the Web in a variety of charts and figures that highlight similarities and differences across countries. Further technical details on the KAM normalization procedure and data sources are provided on the KAM website. KAM's "basic scorecard" is a snapshot of the performance of a specific country or region on all four pillars of the knowledge economy. It includes 14 standard variables: 2 performance variables that score the country in terms of GDP growth and its score on the Human Development Index; and 12 knowledge variables, as can be seen in Graphic 2. The 12 were selected because they are generally available for a long time series and are regularly updated for most countries. More robust data exist for individual countries, but not for enough countries or for long enough periods to make them useful for comparisons.

Graphic 3 shows the different situation of the Mediterranean countries on the aggregate Knowledge Economy Index (KEI). The KEI summarizes performance over the four KE pillars and is constructed as the simple average of the normalized

GRAPHIC 2 Algeria, Egypt, and Syria Benchmarked (Comparison: MENA Region)



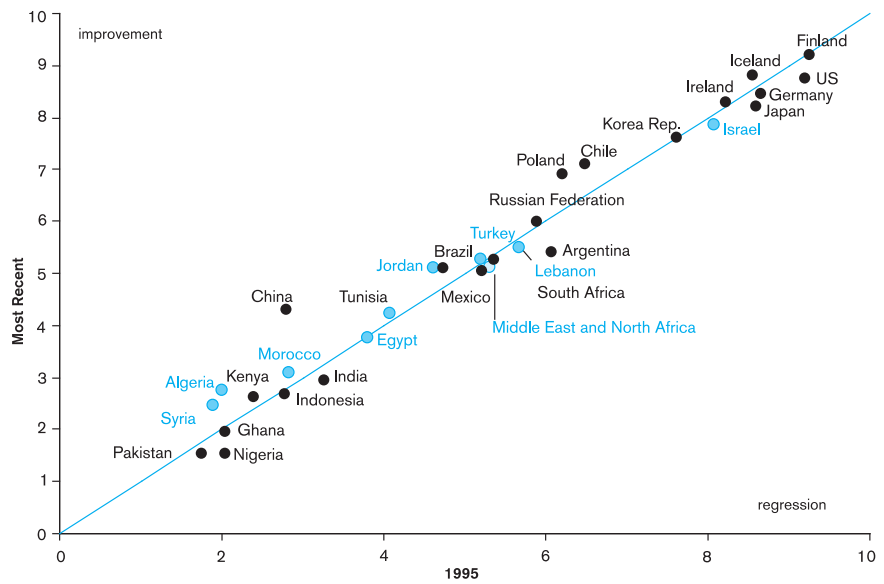
Source: KAM, 2007

values, from 0 (weakest) to 10 (strongest), of 12 knowledge indicators with three variables representing each of the four pillars of the knowledge economy. The horizontal axis plots countries' and regions' performance in the KEI in 1995, while the vertical axis plots countries' and regions' performance in the KEI for the most recent year (updated in November 2006). This aggregate score has been econometrically tested to reveal that there is a statistically significant causal relationship running

from the level of knowledge accumulation as measured by the KEI to future economic growth. As can be seen by Graphic 3 below, there are roughly two distinct groups in the Mediterranean Region: A "leading pack" which, when taken in the context of the world as a whole, is roughly in the average, consisting of Jordan, Turkey, Lebanon, and Tunisia. A second group of Mediterranean countries, consisting of Syria, Algeria, Egypt and Morocco are further behind on this aggregate score, but are, encouragingly,

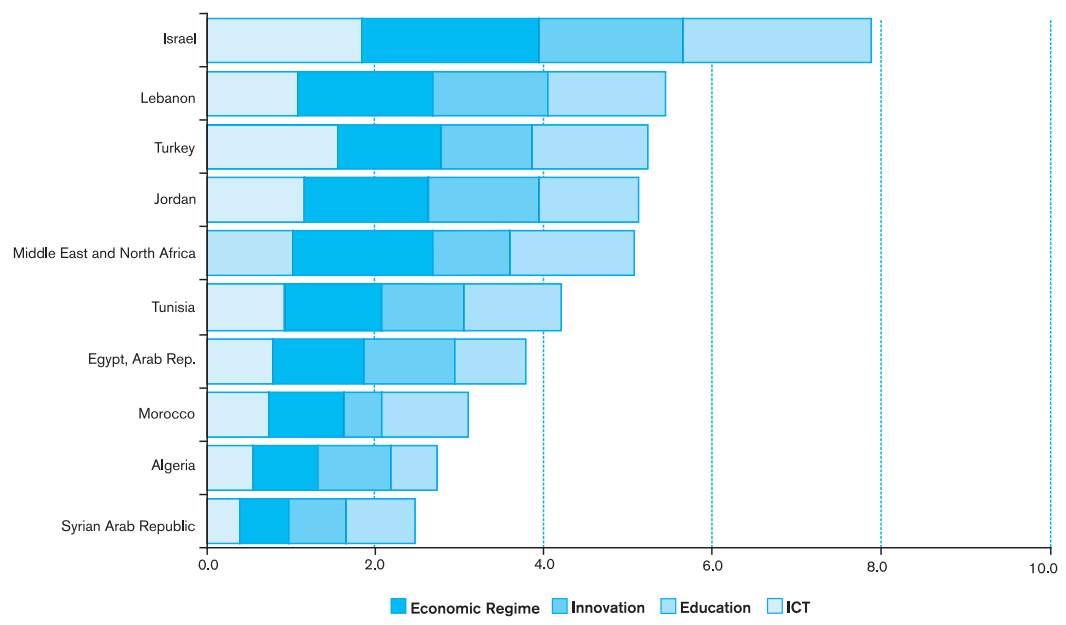
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GRAPHIC 3 The Knowledge Economy Index in Mediterranean Countries over Time



Source: KAM, 2007

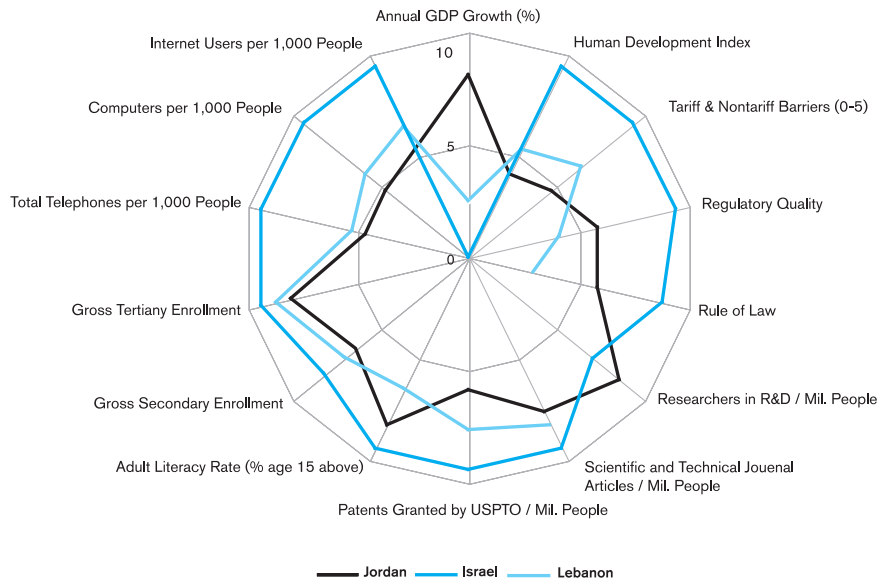
GRAPHIC 4 A Breakdown of the Knowledge Economy Index by Country on Each Pillar



Source: KAM, 2007

GRAPHIC 5

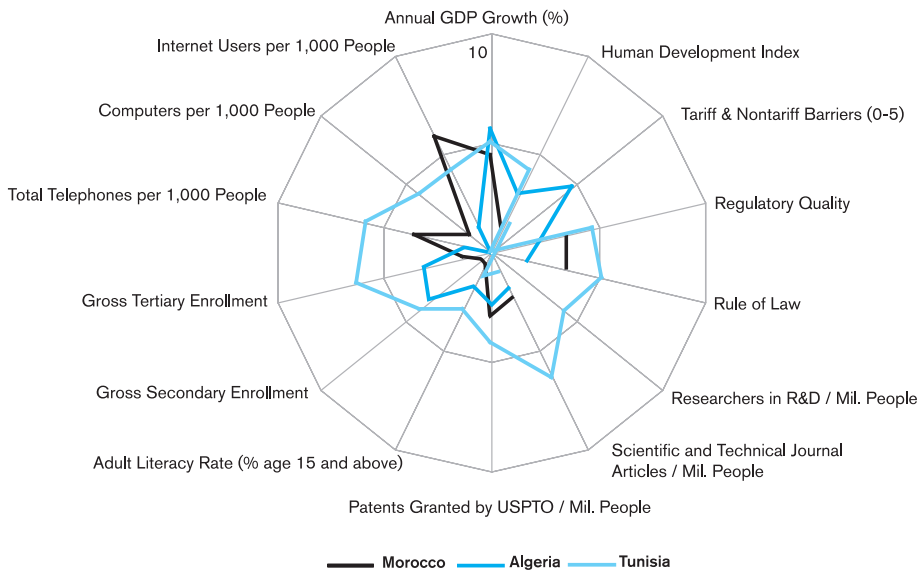
Jordan, Israel, and Lebanon Benchmarked (Comparison: MENA Region)



Source: KAM, 2007

GRAPHIC 6

Morocco, Algeria, and Tunisia Benchmarked (Comparison: MENA Region)



Source: KAM, 2007

catching up over time (this can be seen by the fact that they are placed above the 45 degree line – their scores have improved since 1995). One country of the region, Israel, is close to the developed countries. Graphic 4 provides an interesting perspective on the relative strengths and weaknesses of each of the Mediterranean countries on each of the four different pillars that make up the KEI. It specifically details each of the different data that nourish the KEI aggregate score, which can be compared with Graphics 5 and 6 – showing in greater detail each of the different

data scores for two contrasted groups of Mediterranean countries.

Moving Ahead in Knowledge Economy Reforms in the Mediterranean Area: Country Highlights

How can the different Mediterranean countries boost their growth to further become knowledge-based economies?

Three exemplary country initiatives are detailed below

The greatest single issue facing the economies of the Mediterranean Region is the challenge of employment

– Tunisia, Jordan and Dubai. The latter, although not included as a Mediterranean country as such, can also serve as an illustrative case on how to build a knowledge economy.

Tunisia and the Knowledge Economy

Tunisia is illustrative of an economy which has developed a strong industrial base in sectors such as electronics and textiles by efficiently attracting foreign investors. The success of these industries owes much to a pragmatic policy of significant improvement of the business environment, strong tax incentives and investment in labor force qualifications as illustrated by Tunisia. However, these industries and therefore the economy are experiencing a certain loss of competitiveness. To counter this, the Tunisian government has recently actively embarked on an ambitious knowledge economy program. Knowledge Economy is included as a major axis of the Five Year National Plan with a number of bold objectives and the publication of an annual report on the knowledge economy.

With regards to the different pillars making up the knowledge economy, Tunisia has made quite good progress recently on the ICT pillar, with, for example, the major ICT project represented by the Elgazala techno-pole. Inspired by the technopole approach, it consists in attracting a number of foreign and domestic firms around an infrastructure of schools and research centres. Results in terms of employment are not negligible. However half of the employment is public sector related, and there are not many spill-over effects for the whole economy, the pole tending to remain an enclave in the whole economic system. The Tunisian government plans to establish six techno-poles in other sectors and other cities of the country.

The R&D effort has also been boosted reaching one percent of GDP (in comparison to 0.4% in 1998). It remains however largely funded by the State. The private sector has benefited from technological upgrading through the EU supported “Programme de mise à niveau” (4,000 enterprises over the 2000-2005 period)

More generally, ICT investment was 3.3% in 2001 and 7% by the end of 2006, and has in total created

30,000 jobs from 2002 to 2006. There are a total of around 850,000 internet users in the country. Although recent investments have been made, much remains to be done, as can be seen from the chart below, which compares Tunisia’s ICT to that of higher middle income countries.

Education remains problematic in the Tunisian context, for although a significant amount of funding has been going in to financing education, these investments have not necessarily been fruitful, at least for the time being. Significant efforts in education can be seen from the following figures: enrolment in university was up from 23% in 2001 to 32% in 2004, and enrolment in short curricula was up from 21% in 2001 to 25% in 2004. The rate of Science and Technology diplomas was 13% of total enrolments. However, and alarmingly, the percent of graduates among unemployed rose from 35% in 2002 to 70 % in 2005. This points to a severe mismatch between the educational system on the one hand, and the productive sector on the other, which also implies Economic and Institutional Regime problems (EIR).

The EIR in Tunisia is indeed problematic. Issues concern in particular the governance climate with serious weaknesses on voice and accountability variables as illustrated by a sustained control of the internet. One may suspect also some form of opaque and biased relationship between the rules and business segments, with mediocre conditions of local competition, as well as the problematic soundness of the banking system. These questionable governance conditions explain why there are obvious difficulties to get foreign firms to reinvest their profits in the country, as well as an insufficient influx of new technology-based firms. Finally there is an excessive centralization which prevents the development of local initiatives, notably at the city level. The engagement of the Tunisian government in a KE-based economy remains, however, impressive.

Jordan and Innovations in Education

The Jordan Education Initiative (JEI) grew out of an extraordinary challenge posed at the World Economic Forum (WEF) meeting in January 2003. The JEI’s goal is to accelerate social and economic development in Jordan through broad application of e-learning hardware, curricula and training in order to support the development of a “knowledge economy” and produce sustainable economic growth. JEI has four main objectives: improving the delivery of

education in Jordan through public-private partnerships; unleashing innovation among teachers and students through the effective use of ICT; building the capacity of the local IT industry; and creating a model of reform that can be used by other countries. Program implementation began with the design, development, and deployment of a mathematics curriculum for grades K-12 to be delivered to over one hundred schools. The content is web-based, interactive, and multimedia.

A McKinsey study shows that by 2005, JEI had over 30 active partners from the public and private sectors, including Cisco, Dell, and Microsoft, and public sector organizations such as USAID and the British Council. One hundred Discovery Schools are now fully networked and have access to computer labs and online curricula. A full Math e-Curriculum (grades 1-12) has been developed; Arabic Online, English as a Foreign Language and ICT are also being tested at varying stages in the Discovery Schools; and civics and science online are being developed for introduction in these schools.

There are early indications of some positive outcomes although it is too early to judge the overall long-term impact. In terms of learning, the initial stage of JEI e-curricula and technology is demonstrating an impact on the approximately 2,300 teachers and 50,000 students in the 100 Discovery Schools. Over the longer term, the intention is to roll out the JEI learning model to all public schools in Jordan and to catalyze change throughout society. Informal assessments by external educationalists and members of the Ministry of Education show that the results are promising. However, more remains to be done to train teachers and principals and to deploy technology and e-curricula more broadly. A second intended outcome of the JEI is to develop the Jordanian ICT industry by encouraging partnerships with global firms. Five local companies have benefited from close working relationships with global partners, and approximately US\$3.7 million has been transferred to local companies as a direct result of JEI programs (McKinsey estimates).

Dubai Transition to a Knowledge Economy

In four decades, Dubai has gone from a pearling and trading outpost to a fully fledged Knowledge Economy with global reach and significant regional impact. Its economy, like that of the seven sheikhdoms, or emirates, which made up the United Arab Emirates in 1971, was based on pearling, fishing, trade, and a limited

amount of agriculture. In 1958 the discovery of petroleum off Abu Dhabi marked a first turning point. However, although Dubai had the second largest reserves after Abu Dhabi, these were far less rich, and around 1991 Dubai's leaders began to realize that quantities and therefore revenues from oil would start to decline markedly from 2010.

For Dubai to prosper in the long run, the economy needed to diversify, and two successive generations of visionary leaders implemented a multi-phase, multi-dimensional program to bring Dubai to the forefront of the Knowledge Economy. A first phase aimed at turning the emirate into a transportation and logistics hub linking South Asia, the Middle East and Africa. This led to the creation of the world's largest dredged port (currently ranked tenth in terms of container ship passage), a world class airline (Emirates), and, in view of the success of the Dubai International Airport, the construction of a second airport, the world's largest, Jebel Ali Airport, which, when completed, will see 120 million passengers transit through it (compared to Heathrow's current 85 million) each year. The success of the transport hub strategy led to the development of a tourism strategy which, contrary to all expectations, has been a noteworthy success. The Emirate received over 15 million tourists last year and has built several high-profile resorts and attractions (including Palm City, Dubailand, the world's largest shopping mall, theme parks, resorts, stadiums) to keep tourists coming.

The second phase of Dubai's development centered on building up core competencies in new areas such as technology, media, telecommunications, e-commerce, and other specialized technology- and knowledge-intensive domains. This strategy was launched by Dubai's current head, Sheikh Mohammed Bin Rashid Al Maktoum, and was formulated in two successive plans: the 2010 and 2020 Vision Plans. These competencies were built up through specialized development and free trade zones designed to attract foreign investment and firms in these fields. The zones were established with strong and

To date, investments in education, information infrastructure, research and development and innovation have been insufficient or inappropriate in most Mediterranean countries

well-designed financial and economic incentives for companies, along with a strategy to facilitate business and adopt global rules and best practices. This strategy was at first structured around a technology, e-commerce and media free zone (TECOM) consisting of three separate entities: Dubai Internet City, Media City and Knowledge Village. Dubai Internet City provides a Knowledge Economy ecosystem that is designed to support the business development of ICT companies.

This complex has the Middle East's most extensive IT infrastructure and the world's largest commercial Internet Protocol telephony system. Dubai Media City was launched in January 2001, has attracted over 850 companies and is a leading media hub for the region. Knowledge Village provides infrastructure for developing, sharing and applying knowledge, and provides world-class training services in management, business, human resources and education support. Following these first highly successful experiments, several other specialized technology zones have been or are being created. These include Dubai Technology Park, DuBiotech and Dubai Industrial City. Dubai Technology Park is designed to attract foreign investment in research in oil and gas, desalination and environment management. DuBiotech, otherwise known as the Dubai Biotechnology and Research Park, will service the entire biotechnologies industry. Dubai Industrial City (DINC) provides manufacturing facilities in high-value-added sectors and is strategically located close to the port and airport facilities. It focuses on sectors such as machinery and mechanical equipment, transportation equipment, base metals, foodstuffs (foods and beverages), chemicals and mineral products. It also has a vocational training zone for industrial skills aimed at creating potential entrepreneurs and a skilled personnel base, as well as a commercial area.

As its third and latest phase of its development, Dubai has sought to lure global financial firms and become an international financial hub. This has been facilitated by the massive repatriation of Middle-Eastern finance closer to home following the attacks of 11th September 2001, as well as the recent boom in oil prices. Dubai, after some wrangling with the U.A.E.'s central authorities, won permission to exempt its financial center from almost all of the federation's commercial laws and set up a separate, Western-based commercial system for its financial district that would do business in dollars and in English. This included importing independent Western regulators and judges, a move

that is particularly important for success as an international financial center. However, this phase has not been without difficulties, which almost led to the collapse of the entire project in 2002. When some property development rights in the financial center were allocated to local businessmen without going through the designated auction process, and although there was no suggestion of foul play, the Western regulator made it plain that anything even perceived as back-room dealing would undermine the center's reputation. The Dubai financial-center official reacted by sacking the regulator. This created an uproar which almost became a panicked stampede among the international financial firms present. However the project was put back on track.

Driving Local-Level Change - Cities as Entry Points for Reform

As illustrated by the Dubai case and many other examples in advanced and emerging economies, innovation and growth often begin in specific sectors or locations. Such spots are characterized by an accumulation of a critical mass of talent, resources, and entrepreneurs. Moreover they feature adequate infrastructure (power, transportation) and a permissive, if not supportive, environment for entrepreneurial initiatives. When these conditions are met, competitive industries can emerge, clusters can develop, etc. Examples abound in advanced countries.

The role of government is to facilitate the emergence of such spots. Generally this requires bringing together the elements that can make a difference. In line with a pragmatic approach, some countries have deliberately created enclaves for growth in the form of export processing zones (EPZ) and techno-parks (see Tunisian and Dubai examples), which can offer financial and regulatory incentives to local and foreign enterprises willing to locate in them, along with training facilities. Beginning with low-skill manufacturing, it can be scaled up through astute competitive schemes. The successful creation and scaling up of entry points facilitates the propagation of reform processes by strengthening confidence, overcoming resistance, convincing skeptics and so on. This is why successful initiatives are so important. When they do not succeed, the concerned communities begin to have doubts. This is particularly so when huge investments have been made in ambitious projects that do not bear fruit as early or to the degree expected.

The Need for Intensified International Cooperation

The primary form of international cooperation for boosting knowledge economy initiatives in the Mediterranean area is, of course, the exchange of experience and knowledge sharing. There are plenty of events and loci where such exchanges and learning processes take place.

The Euromed Conference of Ministers of Industry, held in Rhodes in September 2006 was a good example of how, at a regional level, the European Union is supporting the development of the Mediterranean countries and innovation (through Medibtikar). Indeed, innovation is one of the key conclusions of this conference, as well as that of enhancing competitiveness of the business sector.

The World Bank Institute's Paris and Marseille Offices provide expertise and assistance to MENA (and notably Maghreb) governments in developing their KE plans and strategies and hold seminars on specific topics such as technopoles (Tunis, 19-20 June 2007). The Mediterranean Development Fora, the fifth version of which was held from 6-9 April 2006 in Beirut, is a showcase event which can spur progress in the region. MDF5 was a high-profile regional conference focusing on Making Reforms Work in the Middle East and North Africa. MDF5 was organized by the partnership of MENA think tanks, the local hosting partner, the Lebanese Center for Policy Studies, the World Bank Group and the United Nations Development Programme.

However seminars, conferences and knowledge sharing are not enough to cope with the challenges of the region. More operational involvement is needed. EU - related activities have been the main vehicle so far, through the Barcelona process, the MEDA program, and the European Investment Bank. These activities need to be considerably scaled up particularly for boosting all forms of North-South networking – being at the level of enterprises, schools, and individuals – including those of the diaspora communities which as demonstrated by China, India, Israel and Ireland,

constitute an essential development factor in a knowledge economy perspective.

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