CHAPTER TWO:

THE KNOWLEDGE STATUS AND CHALLENGES OF LOCALISATION IN THE UAE

Introduction

This chapter observes the evolution of the situation of knowledge, development and competitiveness of the country with respect to the knowledge society, the knowledge economy and the factors that support active youth participation in the process of transfer and localisation of knowledge. As a first and important step to achieve this goal, the report addresses various global indices inherently related to the establishment of the knowledge society and the knowledge economy, as well as innovation and competitiveness indices. The chapter, on that basis, identifies a number of issues that should be addressed to strengthen the systems of transfer and localisation of knowledge to enhance the capacities of youth in this regard.

The study of the situation of knowledge in the UAE requires a clear distinction between "status of knowledge" on one hand, and on the other, the evolution of information systems, their penetration rates and the circulation of information and data through these systems via organised networks. Knowledge differs from information, as it requires the ability to learn and formulate plans. Moreover, knowledge does not consist of fragmented or general information, but rather comprises well-established skills entrenched in individuals and institutions, which cannot be separated from the cultural and moral surroundings or from its pre-planned objectives.

Information systems, of all forms, are merely carriers or modes necessary for the exchange and consumption of information. Nevertheless, their availability, dissemination and usage rates are among the key indicators in measuring readiness to move towards a knowledge society. However, media modes and networks cannot produce independent or spontaneous knowledge or any added economic or cultural value in the absence of enabling environments capable of integrating and processing information within the wider economic, social and value systems and education and training systems.

In this sense, knowledge and its modern mechanisms of production, dissemination, exchange and consumption becomes the characteristic that distinguishes the knowledge society from previous social systems. It becomes the hub and model of all structures and institutions within this society, and especially the "knowledge economy", which, from an economic perspective, is directly based on the production, dissemination and use of knowledge.[1] It is also referred to as a complex mix of human activity based primarily on the adoption of knowledge as a capital and an economic commodity, as well as its adoption as an accurate quantitative criterion to mark the status of any economy on the sustainable development scale.[2] In other words, a knowledge economy is a system based on activities that use new knowledge as capital or as an engine to produce new goods. Only then, economic prosperity and development can be achieved.

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Therefore, in a knowledge economy, knowledge is the main driver of economic growth, and depends mainly on the availability of information and communication technology and the use of research, development and innovation. In contrast to the production-based economy, where knowledge plays a lesser role and growth is driven by traditional factors of production such as wealth, labour or mechanisation, the qualified and highly-skilled human resources, or the so-called "human capital", are among the most valuable assets in the knowledge economy. The relative contribution of knowledge-based industries with the technological dimension is also another important factor that characterises the knowledge economy. These two elements, i.e. the qualified and trained human capital and the modern technological infrastructure, are critical to the establishment of the knowledge economy.

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Access to the knowledge society coupled with the establishment of its characterising qualitative economy depend, essentially, on the availability of a minimum level of structures, equipment and digital

networks. However, its main capital is the human factor: the citizen and more specifically qualified young people capable of processing information into a feasible economic value. Consequently, countries that have not yet recognised the importance of investing in the human element and its formation, or in the provision of an adequate enabling environment for the knowledge society, will not only fail to be part of the knowledge revolution, but will also become even more marginalised than countries that were not able to catch up with the industrial revolution.[3]

In its diagnosis of the situation of knowledge in the UAE, the report has adopted a number of recent Arab and global indicators

Based on the specific and accurate meanings of knowledge, its economy and society, the UAE report seeks to shed light on the development of the cognitive environment in the country, within the framework of the comprehensive approach of the third Arab Knowledge Report, and based on the latest global and Arab indices related to the knowledge society.

The Situation of Knowledge in the UAE According to the Knowledge and the Knowledge Economy Indices

The Knowledge Index (KI) measures the ability of a country to generate, adopt, and diffuse knowledge and is the average of three factors: education, innovation and ICT

In its diagnosis of the situation of knowledge in the UAE, the report has adopted a number of recent Arab and global indicators. An indicator is a conversion of raw statistical data, derived from administrative records and documents, which are linked to a specific domain. They can help in the diagnosis and identification of problems, and hence support planning, monitoring and evaluation. In this sense, indicators do not provide a detailed picture or result, but they provide the necessary elements for the general diagnosis. The value or ranking for a given indicator should only be interpreted within the framework of the overall indicators. Also, the value of an indicator is closely associated with the pre-set assumptions, perceptions or objectives.

On this level, the World Bank's Knowledge Economy Index (KEI),[4] is considered the most widely used index. The definition of the KEI takes into account four integrated and interacting sub-indices:

- Economic incentive and institutional regime
- Education
- Information and Communication Technology (ICT) infrastructure
- Innovation System

It is worth mentioning that the KEI indicates, according to the World Bank, whether a country's environment is "conducive for knowledge to be used effectively for economic development" and is the outcome of the four above-mentioned pillars. Meanwhile, the Knowledge Index (KI) measures the ability of a country to generate, adopt, and diffuse knowledge and is the average of three factors: education, innovation and ICT.

Table 2.1

Knowledge Economy Indices* in the UAE and in GCC Countries (2012)

Country	Country Rank (of 145 Countries)	Knowledge Economy Index (KEI)	Knowledge Index (KI)	The Economic Incentive and Institutional Regime	Innovation Index	Education Index	ICT Index
UAE	42	6.94	7.09	6.5	6.6	5.8	8.88
Bahrain	43	6.9	6.98	6.69	4.61	6.78	9.54
Oman	47	6.14	5.87	6.96	5.88	5.23	6.49
Saudi Arabia	50	5.96	6.05	5.68	4.14	5.65	8.37
Qatar	54	5.84	5.50	6.87	6.42	3.41	6.65
Kuwait	64	5.33	5.15	5.86	5.22	3.7	6.53

Source: World Bank Statistics and Data Kam, World Bank 2012.
**The index ranges between 0 (lowest) and 10 (highest).*

Table 2.1 and figure 2.1 indicate that the UAE has ranked first among Gulf and Arab countries in the KEI and KI scoring 7.09 and 6.94 respectively. It also ranked 42nd on the international level, among 145 countries, advancing 6 positions from its rank in the year 2000.

It is important to note that the Education Index improved from 4.4 in 2000 to 5.8 in 2012, as indicated in Figure 2.2. The UAE ranked second after Bahrain among the Arab countries and 55th at the international level in the Education Index, which consists of the average of three factors: the adult literacy rate in the country, the rate of enrolment in secondary education, and the rate of enrolment in tertiary education. Surprisingly, this table indicates that the Education Index remains the lowest among the indicators constituting the general index for the knowledge-based society and economy in the country, which calls for increased efforts in this area, vital for the creation of the knowledge society and for increasing the human development rates in general. The next section, which discusses the rates of human development in the UAE, will shed more light on this subject.

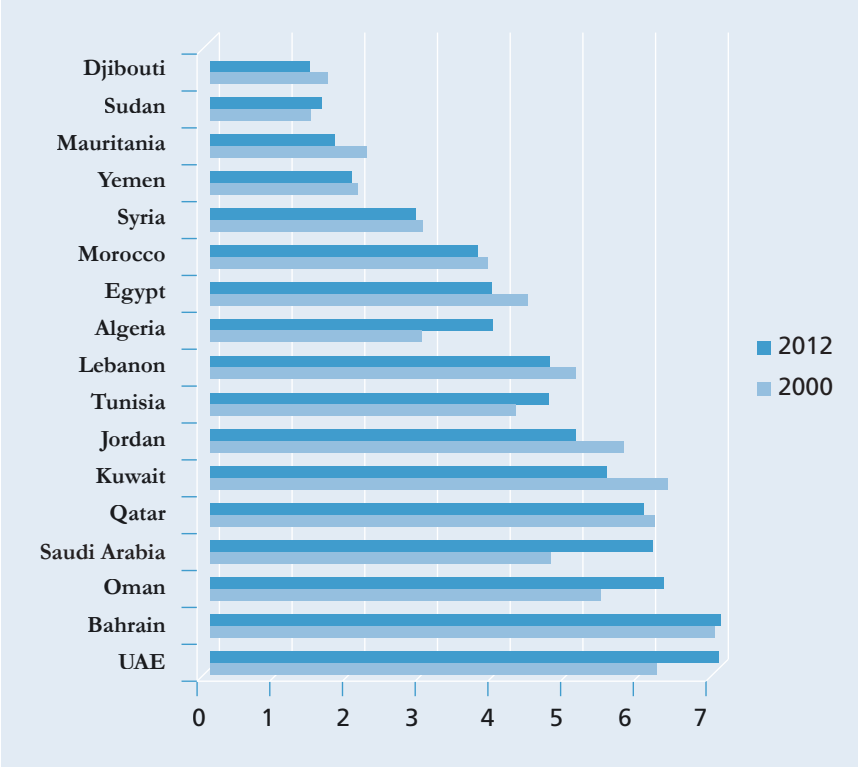
Concerning the ICT Index, the UAE advanced 20 positions and reached the 12th rank on the international level and the 2nd on the Arab one with an average of 8.88, followed by Saudi Arabia and Qatar. Figure 2.4 shows that the UAE ranks first among the Arab countries on the Creativity and Innovation Index, and the 46th on the international level, advancing 35 ranks compared to the year 2000. As for the Economic Incentives and the Institutional Regime Index, the UAE ranks 4th at the Arab level and 50th at the international level, with a score of 6.5.

The Knowledge Status of the UAE according to the Human Development Index

The UNDP's development vision launched in the 1990s under the title of "Sustainable Human Development", gave priority to the human element as the concept of

Figure 2.1

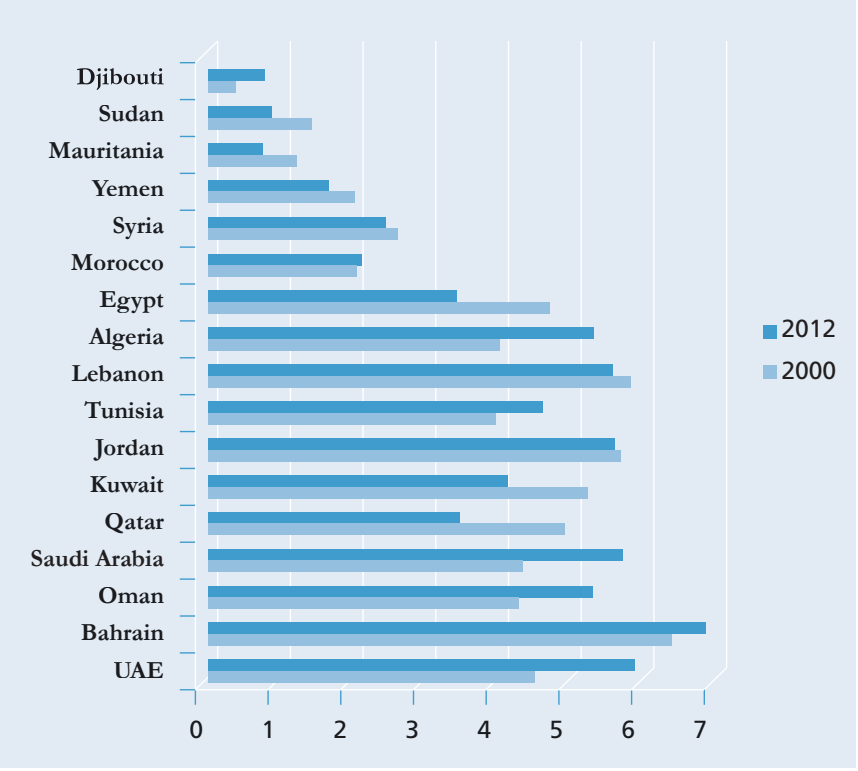
Knowledge Economy Index (KEI) for the Arab States (2000-2012)



Source: World Bank Statistics and Data KAM, World Bank 2012.

Figure 2.2

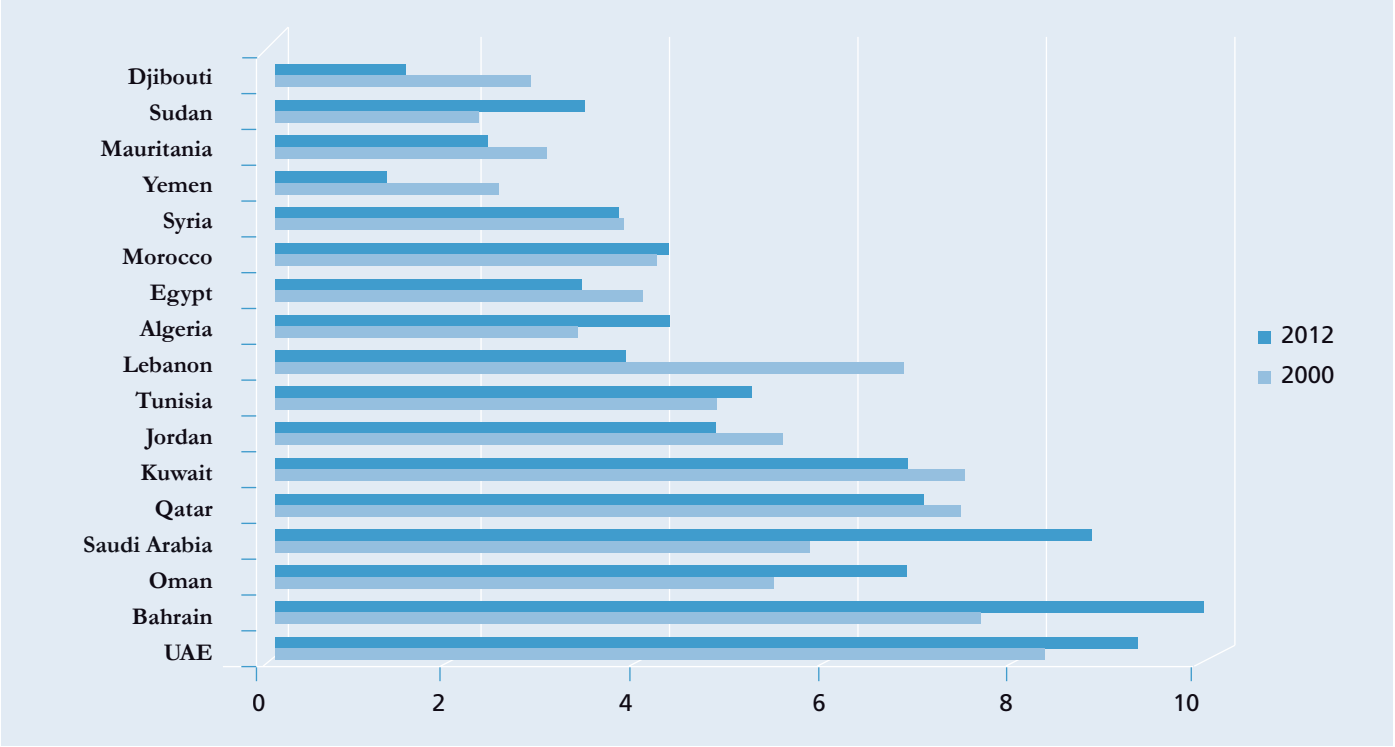
Education Index for the Arab States (2000-2012)



Source: World Bank Statistics and Data KAM, World Bank 2012.

Figure 2.3

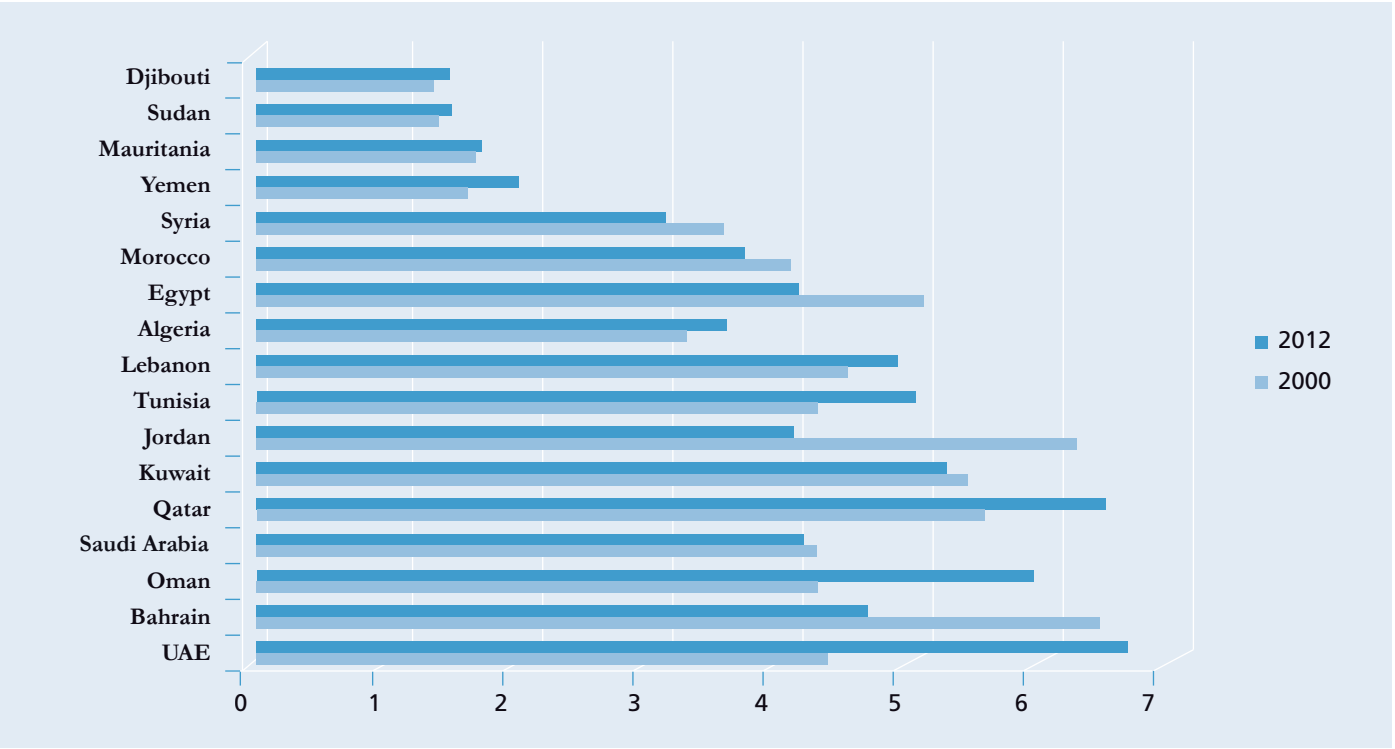
ICT Index for the Arab States (2000-2012)



Source: World Bank Statistics and Data KAM, World Bank 2012.

Figure 2.4

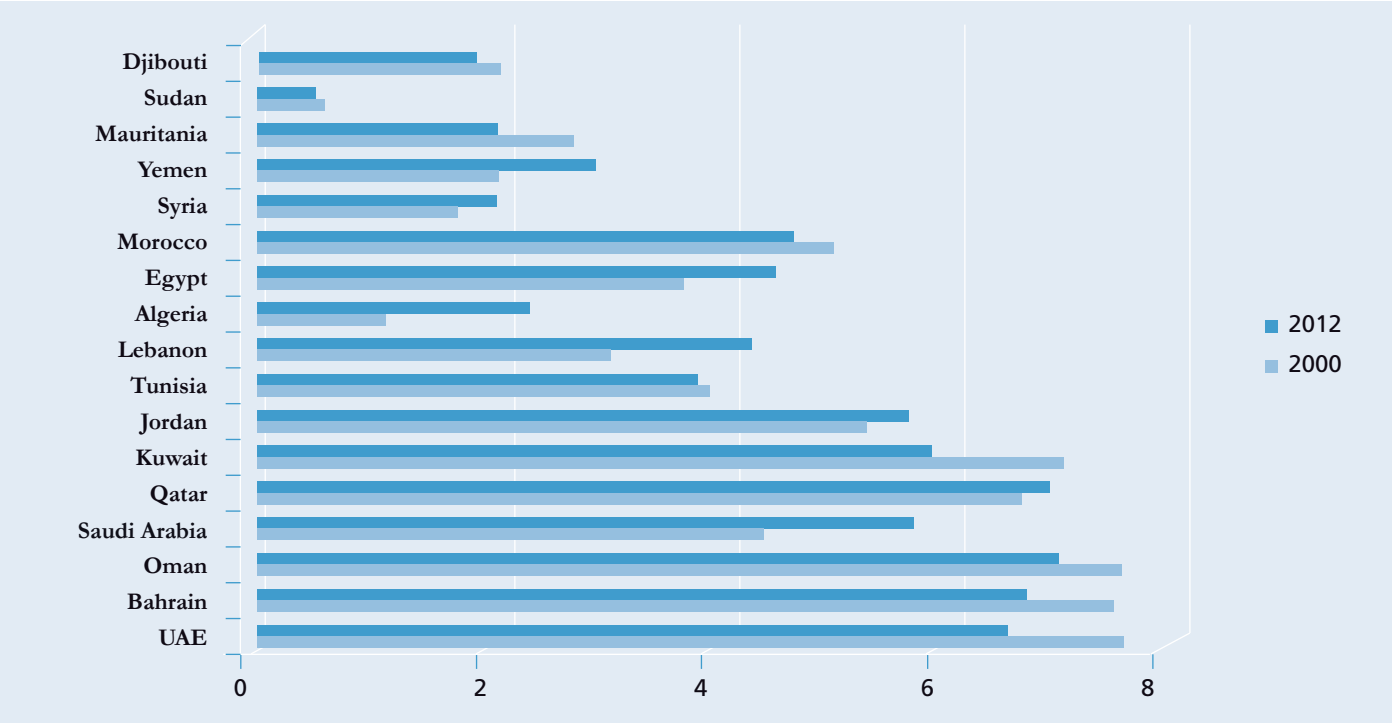
Innovation System Index for the Arab States (2000-2012)



Source: World Bank Statistics and Data KAM, World Bank 2012.

Figure 2.5

Economic Incentive and the Institutional Regime Index for the Arab States (2000-2012)



Source: World Bank Statistics and Data KAM, World Bank 2012.

development is centred on investing in the human capacity.[5] In line with this vision, the Human Development Index shows the progress achieved by the UAE in this area over the last 43 years since its formation, particularly with regards to health, education and income. The UAE's progress is also reflected in the country's position, among the top countries worldwide, enjoying very high human development rates, as determined by UNDP's human development indicators. The UAE ranked 3rd on the Arab level and 40th internationally in the 2014 report (Table 2.2).

The UAE's HDI indicates progress at three levels of development: health, measured by life expectancy at birth; education, measured by the average years of schooling for children and adults; and the standard of living, measured by the GNI per capita. The UAE achieved a total index value of 0.827, while the index value for education was 0.741 and that of health 0.874.[6]

UAE's Human Development Index in 2013 falls within the category of very high development, making the country rank 40th worldwide among 187 countries. However, it should be noted that this rate has dropped from 0.832 in 2008 to 0.827 in 2013.[7]

The UAE's HDI rose between 1980 and 2013: while the average life expectancy at birth rose by 9.2 years during that period to 76.8 years in 2013, the mean years of schooling increased by 5.5 years to 9.1 years in 2013, according to the Human Development Report 2014.[8]

To illustrate the extent of the achievements and challenges faced by the UAE in the future of human development, it would be beneficial to compare it to some of the GCC countries with close HDI ranks such as Qatar and Bahrain, and to the average of the Arab countries as well and to countries with very high rates of human development. In this respect, the UAE's Development Index, at its current value of 0.827, is lower than the average of the countries in the very high human development category (0.890), but is much higher than the average of the Arab countries (0.682). With regards to the countries close to the UAE in terms

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Table 2.2

Ranking of Arab Countries on the 2014 Human Development Index

Country	Human Development Index 2013	Global Rank
Qatar	0.851	31
Saudi Arabia	0.836	34
UAE	0.827	40
Bahrain	0.815	44
Kuwait	0.814	46
Libya	0.784	55
Oman	0.783	56
Lebanon	0.765	65
Jordan	0.745	77
Tunisia	0.721	90
Algeria	0.717	93
State of Palestine	0.686	107
Egypt	0.682	110
Syria	0.658	118
Iraq	0.642	120
Morocco	0.617	129
Yemen	0.500	154
Comoros	0.488	159
Mauritania	0.487	161
Sudan	0.473	166
Djibouti	0.467	170
Countries with Very High Growth Rates	0.890	
Countries with High Growth Rates	0.735	
Arab Countries	0.682	

Source: UNDP 2014.

With regards to the countries close to the UAE in terms of rank, such as Qatar and Bahrain, table 2.3 shows that these two countries ranked 31st and 44th respectively in the Human Development Index, while the UAE ranked 40th in the same index

of rank, such as Qatar and Bahrain, table 2.3 shows that these two countries ranked 31st and 44th respectively in the Human Development Index, while the UAE ranked 40th in the same index.[9]

Table 2.3 presents the human development indicators of the UAE compared to some Arab countries. We notice that despite the country's high rank on the scale of economic growth, the drop of some human-related indicators, namely knowledge formation, has caused the UAE to lag nearly one point (0.063) behind the countries enjoying a very high Development Index (0.890). This fall behind is particularly due to the lag in the average years of schooling index with an average standing at around nine years compared to 11.7 years in the countries with very high Development Index, where this average is expected to reach 16 years in the foreseeable future.

Table 2.3

The UAE Development Indices Compared to Selected Arab Countries

	Development Index Value	Country Rank	Life Expectancy at Birth	Expected Years of Schooling	Average Years of Schooling	GNI per Capita (USD)
UAE	0.827	40	76.8	13.3	9.1	58068
Qatar	0.851	31	78.4	13.8	9.1	119029
Bahrain	0.815	44	76.6	14.4	9.4	32072
Arab Countries	0.682	-	70.2	11.8	6.3	15817
Very High Development Index Countries	0.890	-	80.2	16.3	11.7	40046

Source: UNDP 2014.

The value of the Education Index and the formation of human resources, whether for knowledge, the knowledge economy or the Human Development Index, undoubtedly reflects the major transformation of development in the knowledge society, where the weight of human investment-related indices increases, especially in the areas of education, training, health and quality of life. The transfer and localisation of knowledge as well as efficient youth participation in the UAE remain dependent on the ability to implement human development policies as a strategic priority. The discrepancy between expectations and actual results is evident in education. While the country has set a target for the average years of schooling at 13,[10] this was unachievable due to the lack of motivation and participation among the youth; despite the political will, infrastructure and equipment. We will examine this issue at a later stage.

While assigning quantitative indicators for human development was relatively easy, following and monitoring achievements require additional indicators. Being of a qualitative nature, these additional indicators are often harder to calculate and tabulate. They are mostly related to quality of life, and levels of satisfaction in material and moral terms. In this context, the Innovation, Competitiveness and Happiness Indices are among those that reinforce the central position of humans in the development process, and highlight the importance of knowledge and its economy in the transition towards the transfer and localisation of knowledge.

Ranking on the Global Innovation Index (GII)

Published annually since 2007 by the Business School for the World (INSEAD), the 2014 Global Innovation Index (GII) Report was co-published by INSEAD, the World Intellectual Property Organisation (WIPO) and Cornell University. The GII not only puts particular emphasis on measuring the inputs and outputs of an innovation process, but also on the innovation policies that outline partnerships between industries and knowledge, the formation of innovative groups and the spread of knowledge. These,

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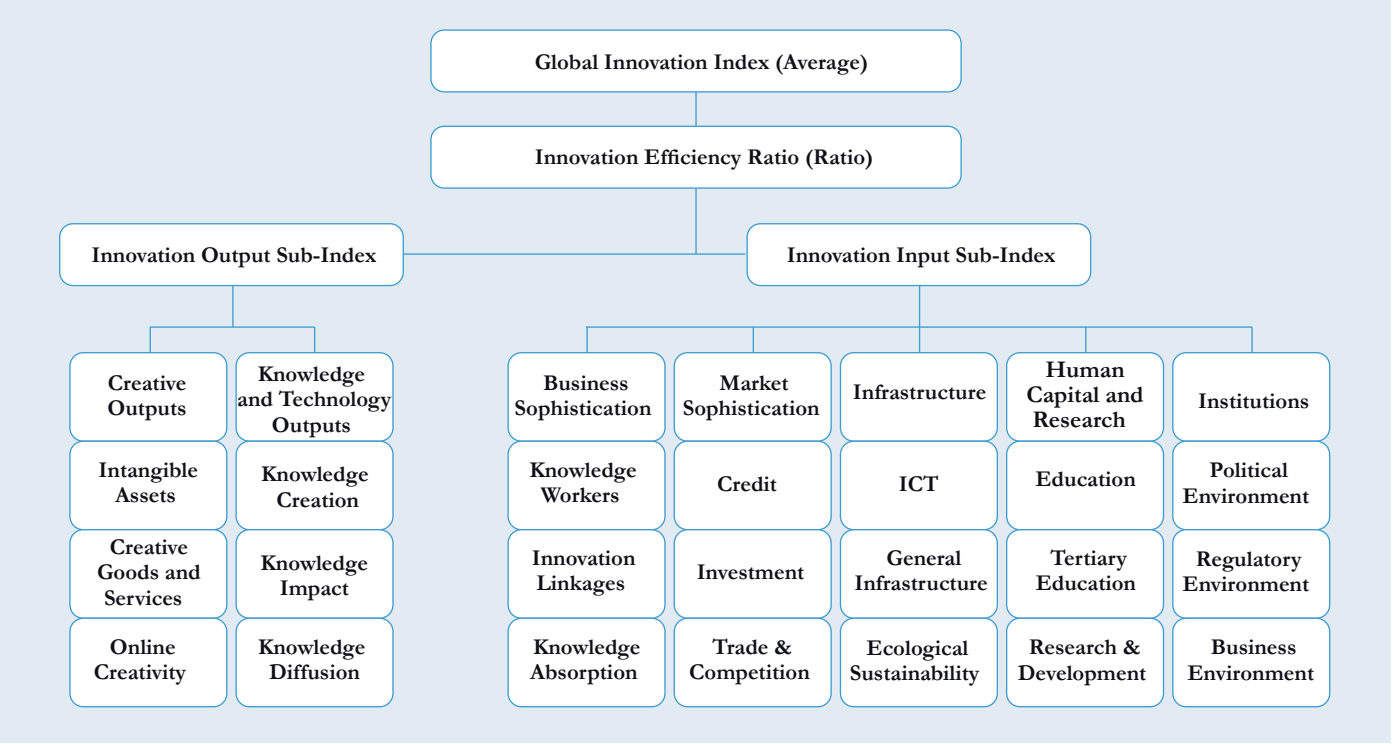
Figure 2.6

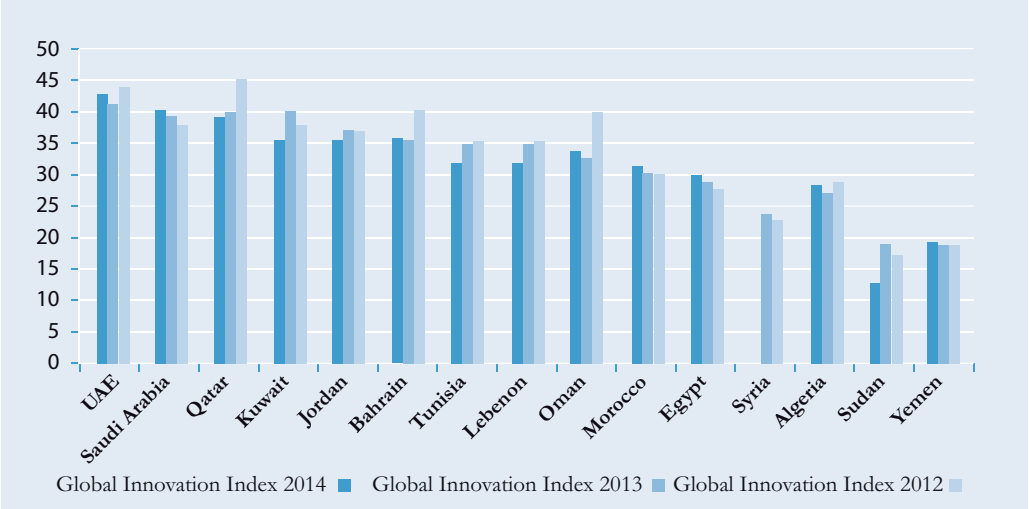
Framework of the Global Innovation Index



Source: Cornell, INSEAD & WIPO 2014.

Figure 2.7

Global Innovation Index for the Arab Countries (2012-2014)



Source: Cornell, INSEAD & WIPO 2014.

The Innovation Output Sub-Index examines knowledge and technology in terms of production, diffusion, cognitive impact, technology and knowledge outputs, and services and information available on the networks

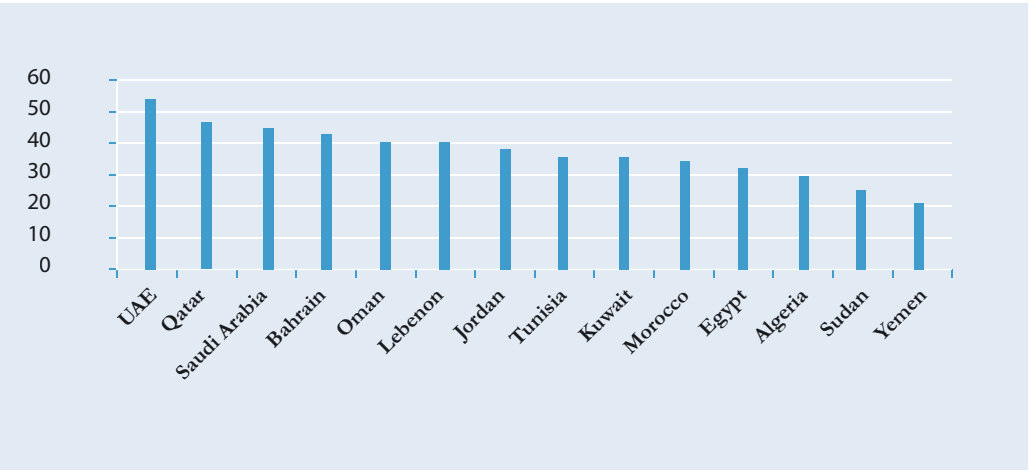
for example, are represented in the number of participating projects and innovation associated with local or international inventors.

Figure 2.6 shows how the GII relies on two main sub-indices; the Innovation Input Sub-Index and the Innovation Output Sub-Index. The Innovation Input Sub-Index looks at economic and legislative institutions, institutions of human capital such as education and tertiary education, research and development, technology infrastructure, stimulating environments that support innovation, markets and investment climate and the intertwinement of the business sector in terms of knowledge workers, creative links and the absorption of knowledge. The Innovation Output Sub-Index examines knowledge and technology in terms of production, diffusion, cognitive impact, technology and knowledge outputs, and services and information available on the networks.

The Global Innovation Index for 2014 highlights the severity of the gap in innovation and knowledge indices for the Arab region, reflected by the Arab countries' ranking in the "Global Innovation" indices, and its evolution compared to other regions of the world. The GII also shows the disparity in

Figure 2.8

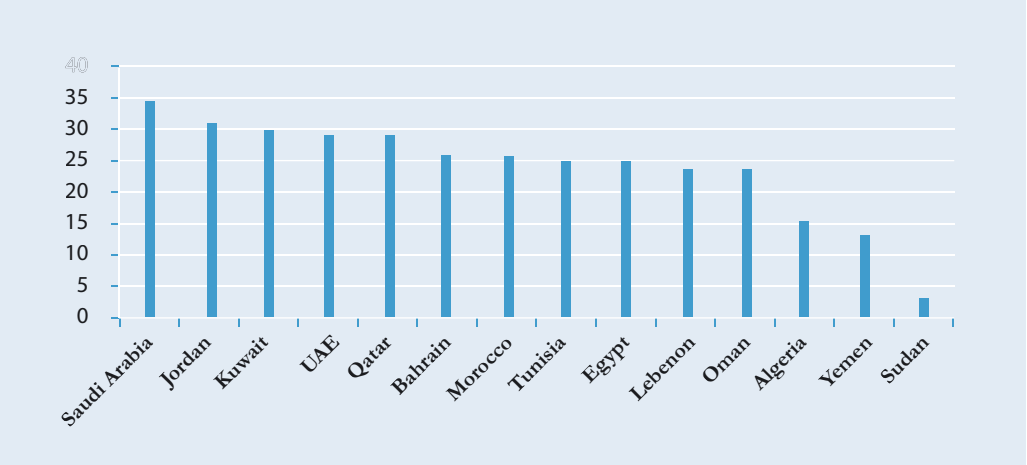
The Innovation Input Sub-Index (2014)



Source: Cornell, INSEAD & WIPO 2014.

Figure 2.9

The Innovation Output Sub-Index (2014)



Source: Cornell, INSEAD & WIPO 2014.

performance in certain knowledge indices among the Arab countries (See Figure 2.7).

First: The Innovation Input Sub-Index

At the international level, the UAE came 25th on the Innovation Input Sub-Index, while it ranked first among the Arab countries, followed by Qatar and Saudi Arabia. This Index is measured by several sub-indices: institutions, human capital and research, infrastructure, market sophistication, and business sophistication. As for the UAE, the country ranked first among the Arab countries in all of these sub-indices except for the market sophistication index where it came 6th.

Second: The Innovation Output Sub-Index

In 2014, the UAE ranked 68th at the international level, advancing 13 positions in the Innovation Output Sub-Index compared to 2013; while the country came 4th at the Arab level following Saudi Arabia, Jordan and Kuwait. Paradoxically, the country's ranking at the international level fell to 132nd on the knowledge and technology index, one of the two pillars of the Innovation Output Sub-Index.[11]

UAE's ranking on the GII (input and output sub-indices) is quite surprising. The country ranked first among the Arab countries in the overall GII, moving to a better ranking and average. Similarly, while the country ranked 25th at the international level in the Innovation Input Sub-Index, it lagged behind in the Innovation Output Sub-Index where it ranked 132nd in one of its pillars – knowledge and technology innovation outputs. Meanwhile, the country ranked 4th at the Arab level and 68th at the international level on the total Innovation Output Sub-Index. It can be concluded from those rankings that the UAE has achieved progress in some of the innovation sub-indices and pillars such as the infrastructure, institutions, business and regulatory environments. This progress, however, was not accompanied by progress in the other sub-indices which led to the country's relative poor performance in the Innovation Outputs. Therefore, the relevant institutions in UAE are called upon to focus on these elements, coordinate and work on the development of the sectors associated with the process of creativity and innovation.

The UAE Ranking on the Global Competitiveness Indices

The Global Competitiveness Reports are considered valuable sources and indices that measure the economic and social conditions in different countries and their relative standings in this regard. It is worth noting the significance of "knowledge", including its components and indices, in

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the determination of a country's position on the global competitiveness scale, based on this index. A closer look at the Global Competitiveness Index (GCI) reveals several other indices directly related to the pillars of knowledge society, such as education, technology, training and creativity, let alone the cognitive element implicitly present in all of the Global Competitiveness Reports' indices.

Within this context, the ranking of the Arab countries reflects the conditions of economic and social development. It also reflects, to a large extent, knowledge conditions in the Arab countries, in terms of gaps and discrepancies, within the region and compared to other countries. Out of 148 countries listed in the Global Competitiveness Report published by the World Economic Forum, the Gulf States in general have occupied relatively advanced ranks, conveying their economic progress and progress in knowledge. Qatar came 13th at the international level, followed by the UAE at rank 19, entering the list of countries with the best economies for the first time, followed by KSA at 20. In contrast, other Arab counties occupied very low ranks on the international level where Mauritania ranked 141st and Yemen 145th out of the 148 countries covered by the report. The UAE has shown continuous progress throughout the Global Competitiveness Reports since 2011, advancing from 27th at the international level (2011-2011 Report), to rank 24 (2012-2013 Report), up to its current position at 19 while it ranked second among the Arab countries (2013-2014 Report). The UAE also ranked 4th at the international level in the "Basic requirements" index of the GCI; and ranked first out of 148 countries in six sub-indices which include the absence of organised crime, the quality of roads and the percentage of annual change in inflation. Furthermore, the UAE ranked among the top five in 18 sub-indices including government procurement of advanced technology products, the ease of accessing loans, and the effect of taxation on investment incentives.[12] However, there is a need to push towards better enrolment-related indices at all education levels and increase women's participation in the workforce.

According to the IMD World Competitiveness Yearbook 2014, published by the International Institute for Management Development in Switzerland (IMD),[13] the UAE has ranked first among the Arab countries (8th internationally), followed by Qatar in second place (19th internationally), and Jordan in third place (53rd internationally).

The UAE also ranked first at the Arab level and fourth internationally on the index "How is your country perceived by the world?" included in the above mentioned report.

The UAE Ranking on the Arab Competitiveness Indices

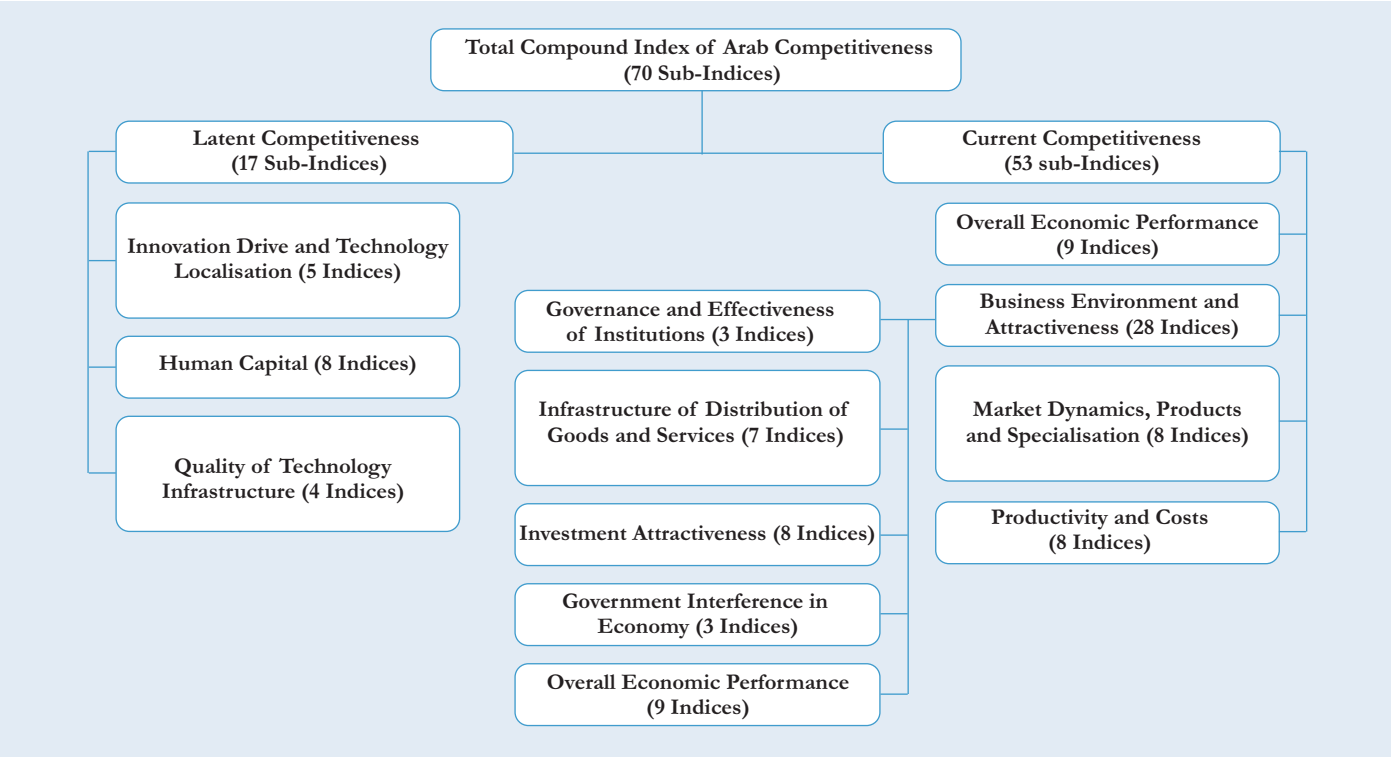
The concept of competitiveness is considered complex and multi-faceted, like other economic and social composites, such as economic and social development and globalisation. Greater attention has recently been given to competitiveness as a theoretical concept linked to development, particularly with regards to achieving greater economic efficiency through the distribution of income and reducing poverty levels. This has resulted in a redefinition of the concept of "competitiveness" by shifting it away from the scope of traditional economic theories that depend on the comparative advantage resulting from the abundance of natural resources and the factors of production, to achieved competitive advantage, that can be developed by adopting targeted policies aimed at building national competitive capacities, especially in the absence of talented resources.[14]

The concept of competitiveness is considered complex and multi-faceted, like other economic and social composites, such as economic and social development and globalisation

Since 2003, the Arab Planning Institute has made a great deal of effort to develop the concept of competitiveness and a methodology to measure it, in line with international efforts. The institute reached a framework based on a composite index that measures and monitors developments in competitiveness of the Arab countries in the international markets. The 2012 Arab

Figure 2.10

The General Structure of the Arab Competitiveness Index



Source: Arab Planning Institute 2012.

Competitiveness Report stems from the premise that competitiveness is the relative "current" performance and the relative "potential" performance of the Arab economies in the context of the sectors and activities that are exposed to competition by foreign economies. Based on this definition, the Arab Planning Institute built a composite index of competitiveness that includes two sub-indices (Figure 2.10).

The first sub-index focuses on the current performance and the factors affecting it, such as the structure of the markets, the business environment and the operations and strategies of the companies involved; while the second sub-index addresses the potential competitiveness of capacities with profound impact which ensure the sustainability of this competitiveness, and thus the sustainability of growth and the achievement of the goals of economic and social development, especially if accompanied by policies geared towards achieving these goals. Three key areas have been identified for potential competitiveness: human capital, the localisation of technology and technological infrastructure. These areas are the outcomes of the reviews on theories of growth and development with regards to the importance of these factors in promoting development in the context of globalisation and the challenges of the information age.[15]

The Arab Competitiveness Report differs from other international reports as Arab countries are classified according to their relative performance compared to a number of non-Arab countries. In fact, the non-Arab countries form a reference point for the performance of the Arab countries in international markets, over which the calculations of the report are based. These comparison countries are Ireland, the Czech Republic, Mexico, South Korea, Chile, Portugal, Malaysia, South Africa, Argentina, Brazil, China, Greece and Turkey, bringing the total number of countries covered in the report to 30 (both Arab and non-Arab), with 17 Arab countries and 13 comparison ones. The selection process for comparison countries is very important because it defines the gap between Arab countries and other countries. If all the countries in the world

The selection process for comparison countries is very important because it defines the gap between Arab countries and other countries

were included in the report, the gap between the Arab countries and the best country in the sample would be huge, which would mean any target that would be set may be difficult to achieve. However, choosing to compare the Arab countries to a specific set of countries that have had a similar performance at a certain time and have overcome it with competitive advancement makes for a good reference point, with the potential to bridge the competitiveness gap with well-tailored policies.[16]

The UAE ranked first among both Arab and comparison countries on the index of Basic Infrastructure; and second after Ireland on the Dynamic Market Index

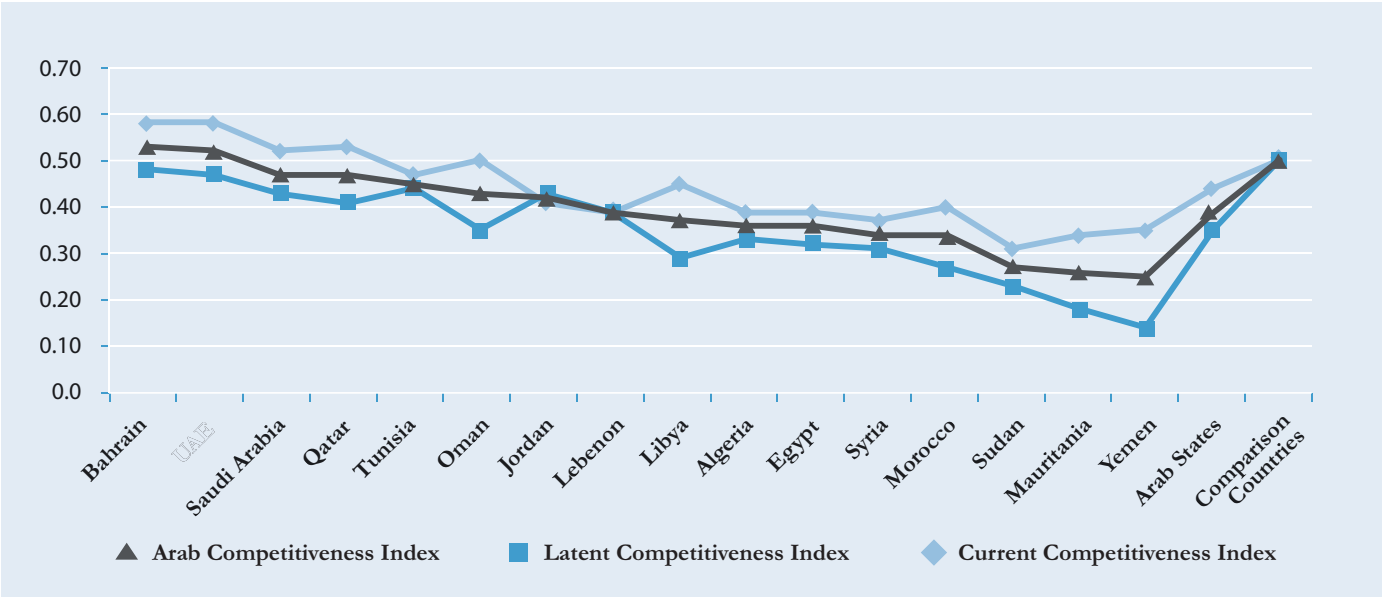
On the overall competitiveness level, the UAE scored 0.52 versus 0.50 for the comparison countries, which means that the UAE has exceeded the average. South Korea led the overall performance of competitiveness, followed by Ireland, Malaysia, Bahrain and then the UAE, which ranks fifth on the competitiveness ladder, ahead of the rest of the comparison countries. The UAE ranked first among both Arab and comparison countries on the index of Basic Infrastructure; and second after Ireland on the Dynamic Market Index. Notable as well, the UAE ranked third in the area of Low Government Interference in the Economy, with comparison countries included; and fourth in the Business Environment Index when including the comparison countries (first among Arab countries). It has also ranked fourth when including the comparison countries and second among Arab countries, after Bahrain, in the Technology Infrastructure Index.

Concerning the Latent Competitiveness Index, the UAE ranked ninth when including the comparison countries, and second among Arab countries following Bahrain. The UAE ranked tenth on the Investment Attractiveness Index. In the Governance and Institutional Quality Index, the UAE ranked twelfth, while Kuwait, Qatar, Oman, and Morocco achieved better rankings. The country ranked 13th on the Production Price Index and 14th on the Cost-of-Doing-Business Index; alongside a modest performance on the Economic Performance Index where it ranked 17th. The UAE ranked twentieth on the indices of Human Capital, Innovative Drive and Technology Localisation.[17]

The UAE's fifth rank in the Current Competitiveness Index and ninth in the Potential Competitiveness Index should be regarded as a warning that the country may in the future fall back in the Composite Competitiveness Index, if not at the level of Arab countries, then at the level of the

Figure 2.11

Competitiveness Indices for the Arab Countries (2012)



Source: Arab Planning Institute 2012.

reference countries. Once again, it seems that the performance of the social institutions concerned with competitiveness varies: while the country ranks first among Arab countries and comparison countries on the Basic Infrastructure Index, and the second among Arab countries and fourth when including reference countries on the Business Environment Index and the Investment Attractiveness Index, it scores notably lower on some of the Latent Competitiveness sub-indices – namely the Innovative Drive and Technology Localisation Index, and Human Capital Index where it ranked 20th.

It is worth mentioning that these last indicators are among the most important for the transfer and localisation of knowledge, which obviously reflect that the country still has to address a number of challenges to achieve knowledge transfer and localisation. The sustainability and advancement of competitiveness in the UAE largely depend on the efforts made in the areas of knowledge transfer and localisation. The same applies for the advancement and sustainability of human development at all social and economic levels.

Ranking on the Happiness Index

The Happiness Index is based on a number of important developmental indicators. These include health indicators – such as life expectancy; governance-related indicators focusing on impressions and corruption; indicators on income (GDP per capita); and other indicators such as freedom of choice and communal support. The index is measured on a scale of 10 degrees.

According to the World Happiness Report 2013, issued in partnership between the Earth Foundation of the University of Columbia and the United Nations' Network of Sustainable Development Solutions, Denmark ranked first globally with a score of 7.693, while the UAE ranked 14th globally and first among Arab countries, with a score of 7.144 and a difference of no more than 0.56 points from the first rank. Oman ranked 23rd globally and second among Arab countries with a score of 6.853, while Qatar ranked 3rd among Arab countries and 27th globally with a score of 6.666.[18]

Challenges of the Transfer and Localisation of Knowledge in the UAE

By establishing and implementing ambitious development projects in economic, social, educational and health fields, the UAE has achieved an advance level in human development, which has enabled the country to maintain a high living standard for its citizens. The UAE was also able to realise significant achievements in ICT, economic incentives and institutional regimes, leading the country to a top position in the Knowledge Economy Index. However, further efforts are required for successfully investing those results in society in order to pave the way for the establishment of the knowledge-based society and economy. There is also a need to overcome the challenges that may prevent or delay the move towards the knowledge-based society and economy coupled with the need to achieve higher levels of human development at all levels.

Review of the UAE's standing, through the above mentioned four indicators highlights the challenge of human capital and other related economic challenges in the country due to the nature of labour in the economy. It also underlines a particular challenge in pre-university and university education systems that have not evolved in the same degree and modality as other areas and institutions of labour, in a way that contributes sufficiently to the transfer and localisation of knowledge. This educational challenge is linked to another cultural challenge, i.e. the challenge of motivating young people and urging them to strive and work hard, not only at school and university, but also in their jobs and businesses. Education, as a challenge, emerges from several overlapping and interlocking points, such as the poor perception of education, traditional teaching methods, the students' choice to memorise, the link between education and the job market, the disinterest in sciences and mathematics and the weakness of the outputs of university

The sustainability and advancement of competitiveness in the UAE largely depend on the efforts made in the areas of knowledge transfer and localisation

education and its incompatibility with the labour market. It is to be noted that there emerges yet another challenge associated with education. This is the challenge of scientific research and development, which results from the small number of specialised research centres; the weak link between research centres and industrial enterprises; the weakness of research funding; and the small number of researchers and the weakness of their level. However, this will be discussed when addressing the issue of enabling environments in the country in the third chapter.

The second challenge, evident from the above discussion, is related to the demographic and labour force structure of the UAE. It focuses on the national human resources and is represented in three aspects: the relatively small national population compared to the number of residents in the country, the citizens' preference to work in the public sector rather than in the private sector, and the rise of unemployment among the youth. These human resources challenges are undoubtedly linked to a general economic issue, which is the high dependence of the public economy on oil. The following is a discussion of these challenges.

The aforementioned World Bank report shows that two-thirds of the students are majoring in arts and social and human sciences rather than in sciences and mathematics, and this has been confirmed by local studies

The Educational Challenge

Investing in humans is regarded as the most important and the best type of investment on the long run. Proper education remains the tool for this investment and a means to develop society and ensure its rise, for the strength of countries is no longer measured by its natural resources, its surplus of capital, its population or the strength of its armies; it is measured by the intellectual and innovative minds that create change and lead the development process.

The World Bank report on education in the Arab World,[19] including the UAE, shows that despite significant progress in achieving good percentages of mandatory education, high enrolment rates in university education, bridging the gap between males and females, and fighting illiteracy, students' performance in international tests taken in the UAE is still less than the average performance of students in some countries at a lower stage of economic advancement. Results of the 2012 PISA (Programme for International Student Assessment) international examination for 15-year-old students showed low results in the UAE compared to their counterparts in the OECD countries in the three examination sections (reading, science and mathematics), where there was significant disparity between the average results of the two groups. The fact that the performance of the UAE students was the best among participating Arab countries – Tunisia, Jordan and Qatar – is not necessarily a strong indicator that students are competent in the three sections. The average results that the students had scored in reading, writing and mathematics in the country are all lower by almost 50 points than the average results of students in the OECD countries. Table 2.4 illustrates these results.[20] This gap was further evidenced by the results of the field study for students in their final school stage in the UAE, carried out as part of the preparations for the Arab Knowledge Report 2010/2011. The results showed a clear weakness in the students' cognitive skills.

The aforementioned World Bank report shows that two-thirds of the students are majoring in arts and social and human sciences rather than in sciences and mathematics, and this has been confirmed by local studies.[21] Traditional teaching methods are still predominant, while more developed countries are moving towards research-based learning, which focuses on problem solving and critical thinking.

Table 2.4

PISA 2012 Results for the UAE and Selected Comparison Countries

	The General Average of Reading	The General Average of Mathematics	The General Average of Science
OECD Countries (Average)	496	494	501
UAE	442	434	448
Jordan	399	386	409
Qatar	388	376	384

Source: OECD 2014.

Several reports have noted that the Arab countries, including the UAE, did not completely achieve their goals in the education field, hindering thereby their ability to innovate. According to the report, the Arab countries failed in producing "knowledge workers" who have the ability to generate knowledge products such as information technology software, patents, or books and research.[22] The previous Arab Knowledge Report AKR 2010/2011 noted educational gaps in the UAE. It has also indicated that such a level of education is in disparity with the technical and informational development the country is witnessing. The report mentioned that the education system and the youth upbringing in the UAE face significant challenges,[23] most notably the high dropout rates at the country level, where statistics show that dropout rates at the school level stood at 2.2% for males and 1.1% for females, especially in Grade 10.[24] The Arab Knowledge Report confirmed that the outputs of the educational system do not conform to the requirements of the global economic changes that require advanced skills in relation to the knowledge economy and globalisation. It also pointed to a decline in the number of citizens in the fields of medicine, engineering, science, agriculture, and industry, a negative factor impeding the transfer and localisation of knowledge and the transformation of the society into a knowledge-based one.

One researcher notes several major reasons pushing Emirati young citizens in high school to choose the literary path or to drop out of secondary education system. First, the stereotypical thinking among many students that the goal of pursuing education is to obtain an academic degree, without carving out the benefits of the learning process for one's success in professional life. Therefore, some students tend to drop out of school if they fail to obtain the degree or as soon as their circumstances allow them to sustain themselves without a degree. The second reason is the rigidity of the educational process and its reliance on traditional teaching methods, without taking into account the character of the new generation, brought up in a revolutionary era characterized by information and communication technology.[25]

In October 2010, during the first specialised annual conference on education, organised by the Emirates Centre for Strategic Studies and Research entitled "The Status of Education and its Future Development in the UAE," the Emirati Ministry of Education identified sixteen challenges facing education in the UAE. Seven of these challenges are directly related to the transfer and localisation of knowledge and to the establishment of the knowledge society. The latter challenges include insufficient learning methods such as libraries, traditional teaching methods based on memorisation and rid of critical thinking strategies, rigid teaching methods lacking active student participation that depend for the most part on listening to the teacher and writing down lessons, and traditional curricula taken from foreign countries. Students also suffer from weak guidance who, more often than not, choose majors not in line with the labour market's needs. These challenges are further heightened by the weakness of the secondary education system and its incompatibility with the requirements of higher education, requesting students to spend a foundation year at universities.[26]

In his assessment of education and its role in creating the knowledge economy, Alan Weber claims that education does not encourage creativity, and the curriculum neither interests students scientifically nor challenges them enough. The communication between the teacher and the student shrunk to its lowest degrees, and only focuses on memorisation and remembering. Additionally, the school management does not have sufficient authority to take the necessary actions given the rigidity of the educational system and the fewer opportunities for students to express their creativity, which hinders even further the establishment of the knowledge society.[27]

In his assessment of education and its role in creating the knowledge economy, Alan Weber claims that education does not encourage creativity, and the curriculum neither interests students scientifically nor challenges them enough

The Status and Challenges of University Education

The UAE has established a system of higher education within the framework of social

and economic model and in the context of globalisation and neo-liberal frameworks, with a focus on professional and human sides.[28] It also provided opportunities for the opening of private universities to develop the university education sector by integrating smart technology in public universities and paving the way for private higher education. Despite that, the relationship between the needs of the labour market and graduates remains a critical issue.

Research has identified a number of challenges in this field. Among them is a shortage of people studying medicine, engineering, science and ICT, as most students tend to enrol in the humanities. As a result, the country is forced to hire foreign expertise.[29] On the other hand, students' perspective on university education and its importance may pose a serious threat to the transfer and the localisation of knowledge and to the establishment of a knowledge society, as some students only see a university degree as a mere tool to work in the public and government sector, which offer lucrative salaries.[30] The second danger in this view is that most students believe that education is the final product and not a continuous process; many college graduates do not consider themselves lifelong learners, but regard graduation as the end of their commitment to the learning process.[31]

A labour force survey in 2008 has shown that 89.5% of male workers and 83.7% of female workers are employed in government and joint sectors

Another researcher argues that the main problems faced by the university education system include its reliance on a group of advisors who lack the required qualification to achieve the goals; its lack of educational materials related to the country's socio-cultural context; and the absence of a long-term vision on educational offerings and the availability of specialisations.[32] With the country's reliance on foreign consultation and knowledge imported from private higher education institutions, the concerned educational institutions become limited in their ability to engage effectively in the development challenges or to contribute to the localisation of knowledge through local curricula and input for research. Ironically, the restructuring reforms provided an opportunity for the expansion of the higher education sector in an unprecedented manner, but only to prove later that the increased reliance by higher education institutions on visions of modernity and globalisation does limit the country's ability to localise knowledge in a system that best fits the country's cultural context.[33]

The number of students enrolled in universities has increased, but the increase in those numbers did not translate into the development of the knowledge economy or the creation of a generation or a critical mass capable of creating this economy. There are many obstacles that prevent the country from achieving that, such as some of the non-positive cultural concepts and the employment of some people for jobs that may not be commensurate with their potential and competencies. All these factors weaken the value of education and its perception, hindering the outputs of the education system and the impetus it may provide for the localisation of knowledge and the establishment of a knowledge society in the country.[34]

The Youth Motivation Challenge

One of the major challenges in the transfer and localisation of knowledge is the lack of initiative and motivation among the youth and graduates, who tend to seek secure jobs in the governmental sector. Often, Emirati youth tend to pursue administrative jobs that offer good incomes and avoid sectors directly related to the transfer and localisation of knowledge, especially those associated with innovation, scientific research and technology. Most male citizens prefer to join the police or the army after preparatory or high school, while most female citizens prefer to work in governmental departments. A labour force survey in 2008 has shown that 89.5% of male workers and 83.7% of female workers are employed in government and joint sectors.[35]

The UAE has been able to provide the enabling environments, as will be seen in the third chapter. However, this should be paralleled by a motivated youth who want to effectively integrate into the processes

of knowledge transfer and localisation. The Arab Knowledge Report 2010/2011 showed that one serious challenge that faces the Emirati society is the lack of real incentives among youth and the focus on consuming knowledge products represented by various commodities without engaging in genuine processes of knowledge production or in the employment of these products for the benefit of development.

A study carried out by the Ministry of Culture, Youth, and Community Development in the UAE in 2009 showed that those between 18 and 23 years old believed in some extremely passive attitudes when it came to their perspective towards knowledge. For example, some believed that knowledge was simple and not subject to change and that the ability to learn was innate and not linked to exerting effort. This proves that there is a dire need to bring about change and critical development in the current educational system. Such change would aid in the move from traditional education based on memorising and remembering to education based on the skills of creative thinking, innovation, scientific research, and constructive criticism from the earliest stages of education. Thus, the state can build a national human capital of citizens who are capable of skilful interaction and communication in the era of knowledge.[36] The final chapter of this report will provide a vision towards making this move.

The Human Resources Challenge

One of the major challenges facing the UAE in the transfer and localisation of knowledge and in building the knowledge-based society is the limited number of citizens or local human capital; citizens make up 11.5% of the total population.[37] This is the first aspect of the human resources challenge facing the country and society.

Due to the population gap, enhancing the role of citizens has become a major challenge in the UAE. The citizen workforce needs to be developed and the human capital invested in to create cadres who possess the necessary skills and capabilities to transfer and localise knowledge. Such skills include positive thinking, problem solving, communication and the use of technology, effectiveness in the community, belonging and openness.

More optimistic is the youth's significant interaction with the huge developments in social media and communication. It should be noted here that we do not deny the role of expat human resources in the transfer of knowledge and the establishment of economic infrastructure, just as we cannot recommend to dispense with all foreign workers and depend on the local workforce for the time being, as this would be a waste of a significant force of knowledge in the country that can actually help the national workforce and develop citizens' human capital in the processes of knowledge transfer and localisation.

The citizen workforce needs to be developed and the human capital invested in to create cadres who possess the necessary skills and capabilities to transfer and localise knowledge

The second aspect of the human resources challenge is the emergence of youth unemployment as the result of the influx of graduates year after year from institutions, colleges, and universities into the market. This has coincided with the decline of employment opportunities in the government sector, which had been able - until recently - to accommodate all graduate citizens. The situation has been exacerbated as the youth are attracted to majors that may not be in line with the requirements of the labour market, such as humanities and management as outlined above. As a result of fewer opportunities and shortcomings in the plans and programmes aimed at accommodating the citizen labour force in non-governmental sectors, citizens have been forced to enter into an uneven competition at home with the expats. This has led to high unemployment rates among job-seeking nationals. Unemployment is concentrated among those aged between 20 and 35 years old, who are mostly high school and intermediate graduates, or university graduates; the overall unemployment rate is 4.6%.[38] Despite this low percentage, the issue should be given more attention.

The third aspect of the human resources challenge is the limited number of citizens

Box 2.1

Knowledge Trends among the Youth in the UAE

The Ministry of Culture, Youth and Community Development in the UAE conducted a study in 2009 to identify the prevailing knowledge trends among young Emiratis aged between 18 and 23 years old. Most notable, the study pointed out to the following:

The youth have a firm belief that knowledge is simple, and that information is not related and is neither interdependent nor integrated. They consider the teacher to be the source of knowledge, especially in their early years of undergraduate study. This affects their learning style as the youth tend to rely on the book and the professor as sources of information. Such convictions contradict with the basics of learning and the knowledge society where students look for information on their own and build knowledge with their colleagues. Students must be prepared to rely on themselves since self-reliance constitutes the basis for the formation of an independent personality capable of learning and producing knowledge.

Some youth believe that knowledge is certain and is not changeable. This perception should be changed because knowledge is variable and may not be fixed. This is vital given its importance in the process of knowledge development and the creation of new knowledge.

Those with diplomas tend to believe that the ability to learn is innate, and that one cannot learn how to learn, that success is not linked to perseverance and efforts compared to other categories of participants in the study. This result reveals some sort of a problem for this category of people because it is imperative to believe that knowledge is acquired, and what this belief implies in being reflected at the level of the efforts made to obtain knowledge.

Some young people tend to believe that success is not associated with perseverance and effort, and therefore they might not be making any effort to build knowledge or carry out a knowledge activity in order to develop their knowledge.

The negligence of parents when it comes to knowledge aspects, that is, in terms of buying books, visiting exhibitions, and even holding conversations with their children. The reason for this is probably related to the parents' educational level and their concern with several other issues, particularly with regard to the economic aspect, many times at the expense of the knowledge aspects.

The youth are reluctant to visit public libraries, and become well-versed with the knowledge available on the Internet, or attend seminars, lectures, and workshops that are held in the country, or participate in the cultural programmes on the media, or even participate in knowledge competitions.

Books were ranked last among the methods used by the youth to acquire knowledge. This means that it is necessary to increase their interest in reading books and references, due to the latter's importance in the development of thought in the present era and its impact on the creative process in all fields.

Source: Quoting the Ministry of Culture, Youth and Community Development 2009.

Source: Qouting the Ministry of Culture, Youth and Community Development 2009.

A background paper for the report has pointed out that, based on the records of the UAE Ministry of Labour, the number of workers in the private sector is 3,895,695, out of which 19,874 are citizens, i.e. 0.05%

working in the private sector; most Emiratis will avoid it if offered a job in a government institution. A background paper for the report has pointed out that, based on the records of the UAE Ministry of Labour, the number of workers in the private sector is 3,895,695, out of which 19,874 are citizens, i.e. 0.05%. This is a low percentage, making the contribution of national labour in the private sector minimal, especially when it comes to the transfer and localisation of knowledge to build a knowledge economy and society. Moreover, 76.8% of those jobs assumed by citizens involve wholesale, retail, trade, real estate and financial intermediation. These careers do not rely on educational certificates or advanced vocational training,[39] thus posing serious questions on the appropriateness of such a local labour structure in the private sector for the requirements of building the knowledge economy and knowledge society.

Workers in the private sector are considered to be among the major driving forces since they shoulder the responsibility of leading the economic development of the UAE. Given the fact that the workforce in the private sector comprises mainly temporary and foreign workers, it does not achieve one of the most important objectives of human development – ensuring sustainability by involving citizens in the process, where they become contributors rather than receivers. Building the Emirati human capital in all fields is necessary to achieve development.

Accordingly, increasing the percentage of citizens working in the private sector and ensuring they are efficiently skilled are two of the most important determinants to the success of the policy to catalyse the work environment in the UAE towards the transfer and localisation of knowledge and a knowledge society.

It is worth mentioning that the process of knowledge transfer for citizens has been carried out in some sectors such as the oil sector, but it hasn't been executed to the same extent in other sectors. This might be due to the lack of interaction and communication between foreign and local companies, and between residents and Emirati citizens. This might also be due to the various social, cultural, cognitive and technological backgrounds of each of these parties. Although they all operate in one country, and in close sectors, they operate as if through isolated clusters. Hence, there is an urgent need to increase communication between these parties to contribute to the building of networks and partnerships, which will allow for establishing common systems of creativity and innovation.

The localisation programme for Emiratis in the private sector is an important national programme. However, imposing such a policy on companies might not be feasible for the goal of gaining experience and attracting competences based on efficiency. The small number of nationals in the private sector is not only due to the high salaries in government institutions, but also to a lack of skills, education, training and ability to compete with expatriates. Thus, those in charge of the programme should not give citizens a sense of entitlement with their employment just because they are citizens; rather, employment should be based on data market, competition and merit. This will be a motivation for citizens to compete and be ambitious so as to develop themselves accordingly. Although this might be resented by some citizens, it is the only and best way to push them to accomplish and work hard in the labour market. Paradoxically, the UAE creates a competitive market that attracts people from all over the world while it still cannot push its own citizens to enter the market based on their own competency.

The Economic Challenge

The UAE 2013 Annual Economic Report issued by the Ministry of Economy concluded that despite the many merits achieved and the favourable economic opportunities, the country still faces a number of challenges that might hinder its journey and its ability to achieve the goals of sustainable development. These challenges should be addressed through innovative and non-traditional approaches, while taking the necessary measurements and precautions to limit its negative impacts and bring it to an end. One of the main challenges as such is the limited size of the citizen population needed as a base to carry out the requirements of development and the resulting dependency on expat human resources. The end result is manifested in two problems; an imbalance in the labour market and another in the structural composition of the population. That is what we have touched upon when we discussed the challenge of "human capital" in the country.

The small number of nationals in the private sector is not only due to the high salaries in government institutions, but also to a lack of skills, education, training and ability to compete with expatriates

The other economic challenge facing the country – which was also mentioned in the UAE 2013 Economic Report – is the continuous reliance on oil as a major and essential resource for the country, and the consequent fluctuation of the state's revenues in financing the development movement. The country has been making efforts to find alternatives to public revenue, and has been successful in diversifying the sources of income from other sectors such as trade, transport, communications and industry as well as re-exportation, given the special geographical location of the UAE, leading to an increase in the contributions of non-oil sectors in output; from 62.5% in 2006 to 67.3% in 2012. This percentage dropped to 61.14% in 2013, according to estimates of the National Centre for Statistics (see Chapter III). However, the financing of development projects and programmes is still dependent on the country's resources from hydrocarbon exports, which is not expected to change in the near future.[40]

The persistence of this economic system – which relies mainly on oil to finance development and on the diversity in other sectors dependent mainly on trade and transport – does not provide the required driving motives for the transfer and localisation of knowledge

The persistence of this economic system – which relies mainly on oil to finance development and on the diversity in other sectors dependent mainly on trade and transport – does not provide the required driving motives for the transfer and localisation of knowledge. The nature of these sectors and the prevailing patterns of production in the UAE, include in general low added value of knowledge, especially when compared to the productive sectors and industries with high added value of knowledge as is the case with the electronics industry. The oil sector is mostly based on the extraction of crude oil and thus does not involve a high added value of knowledge. The same applies to other sectors which have dramatically grown in the UAE. Such sectors include trade and transport, as well as the telecommunications sector that has relied on the consumption of knowledge products without a real transfer or localisation of knowledge that accompanied the production of these vital tools for the knowledge society. Despite understanding and appreciating the major role played by these sectors in supporting development in the UAE and pushing it towards higher levels, and within the framework of the localisation of knowledge and the establishment of the knowledge economy, this report highlights the importance of reconsidering the general economic structures and the productive and active sectors in the UAE so as to gradually move towards economic practices and sectors of higher knowledge value.

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