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Information and communications technology in the middle east: Situation as of 2010 and prospective scenarios for 2030

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Information and Communications Technology in the Middle East: Situation as of 2010 and Prospective Scenarios for 2030

Jawad Abbassi

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Contents

Abstract **8**

1. Indicators of ICT market and e-Government services: status as of 2010 ... **9**
1.1. Regulatory framework 9
1.2. Privatization 10
1.3. Telecom coverage status 12
1.4. Comparison with the rest of the World 14
1.4.1. Cellular coverage and ranking *14*
1.4.2. Fixed lines and Internet coverage and ranking *15*
1.5. Infrastructure Index 16
1.6. Global e-Government Development Index 17
1.7. Web Measure Index 18
1.8. E-commerce 20
1.9. Prices and relative pricing status 21

2. Forward looking analysis **25**
Illustrative scenarios 28

3. Concluding remarks and the role of the EU **31**

Annex 1. ICT regional comparison **32**

Annex 2. Countries overview **35**
Algeria. 35
Egypt 36
Israel 38
Jordan 40
Lebanon 42
Libya 43
Morocco 45
Palestine 46
Syria 48
Tunisia 49
Turkey 51

List of Tables and Charts

Chart 1. Cellular ranking: subscriptions' estimates per 100 inhabitants (2010) 15
Chart 2. Fixed lines ranking: lines' estimates per 100 inhabitants (2010) 15
Chart 3. Internet users ranking: users' estimates per 100 inhabitants (2010)..... 16
Chart 4. Infrastructure Index (2010)..... 17
Chart 5. Global e-Government Development Index (2010) 18
Chart 6. Web Measure Index (2010) 19
Chart 7. E-commerce portals targeting the Arab World; locations of headquarters (December 2010)..... 20
Chart 8. Average Total annual costs of 1024 Kbps ADSL as a % of GDP per capita 24

Table 1. Status of competition in ICT (2010)..... 10
Table 2. Privatization of telecom operators (2010) 10
Table 3. Cellular, fixed and Internet coverage (2010)..... 12
Table 4. The total ICT services in the MED11 countries 2010 13
Table 5. Country by country state in the MED11 countries (2009) 14
Table 6. Internet users' usage of e-Government..... 19
Table 7. Respondents usage of e-commerce 21
Table 8. Postpaid average minute rates (March 2010) 22
Table 9. Prepaid average minute rates (March 2010)..... 22
Table 10. Total annual costs of 1024 Kbps ADSL as a % of GDP per capita (September 2010) 23
Table 11. "Ease of doing business" rank..... 28
Table 12. A "gaze" into the future: Three scenarios for 2030..... 29
Table A1. Cellular coverage (2005 – 2010) 32
Table A2. Fixed lines coverage (2005 – 2010) 32
Table A3. Internet coverage (2005 – 2010)..... 33
Table A4. Status of competition in ICT (2005 – 2010)..... 33
Table A5. Internet licensing regime in Egypt..... 38
Table A6. Libyan upcoming telecom entrants in 2011 44

List of Acronyms

Acronym	Description
ADSL	Asymmetric Digital Subscriber Line
AJIB	Arab Jordan Investment Bank
CIS	Commonwealth of Independent States
EU	European Union
FDI	Foreign Direct Investment
FO	Fiber Optics
FTTH	Fiber to the Home
GDP	Gross Domestic Product
GDP per capita	Gross Domestic Product divided by the population
ICT	Information and Communication Technology
ITU	International Telecommunications Union
KSA	Kingdom of Saudi Arabia
LTT	Libya Telecom and Technology Company
MENA	Middle East and North Africa
NA	Not Available
PC	Personal Computer
TV	Television
UAE	United Arab Emirates

The author

Jawad Abbassi, founder (in 2001) and General Manager of the Arab Advisors Group in Amman. Before founding Arab Advisors his career included, among others, working as a corporate accounts manager for Jordan's leading Internet service provider (NETS), Senior Analyst at the Economist Intelligence Unit in Boston and senior telecommunication and technology consultant in the Yankee Group in Boston. He obtained BSc in engineering from the American University in Cairo in 1993, MSc in information systems from the London School of Economics in 1998 and Harvard Business School executive education in 2010. He is a frequent speaker at conferences and seminars related to technology, communication and media in the Arab World.

Abstract

This study analyzes the progress in information and communication technologies (ICT) in eleven MED countries and how they compare to the rest of the world in terms of sector's sophistication and development. In recent years, most countries of this region opened up their markets for multiple players, greatly enhancing competition and increasing the number and quality of services. However, compared with the rest of the world, the region has still lagged behind. Yet this could change fairly rapidly as more countries adopt liberalization polices and good governance that would attract FDI and expand the markets. Being a laggard may actually avail some benefits, as countries adopt best practices and learn from the pitfalls of earlier liberalizers!

Compared to other regions, generally MED countries rank below the Americas and Europe in terms of cellular, fixed and Internet adoption rates. However, they rank above Africa across all services and above Asia/Pacific in cellular and Internet services penetration.

Looking ahead, the paper analyzes three scenarios for the coming 20 years; pessimistic, steady state and optimistic. There are a number of key factors that would drive these various scenarios and their illustrative outcomes, such as the investment climate, regulatory institutions (this includes the rule of law, judiciary, transparency and fairness) and the government openness to participation of citizens in public affairs.

1. Indicators of ICT market and e-Government services: status as of 2010

1.1. Regulatory framework

In line with global practices, there is a general move towards establishing regulators to oversee the telecom sectors in the MED11 countries. In most MED11 countries, there are telecom regulatory bodies whose responsibilities include issuing licenses, allocating spectrum and numbers and/or regulating competition and prices. Despite claims of independence, many regulatory authorities remain closely tied to government with ministers and other government representatives heading and occupying various seats in their boards; some regulators, as in the cases of Lebanon, must get Ministry approval on all decisions before their enactment. Moreover, in quite a few Arab countries, persons close to the ruling regimes exercise massive influence over the telecom sector and are able to influence tender outcomes.

Still, the establishment of regulators came with a general policy for privatization and liberalization. As a result, most countries under study opened up their markets for multiple players, greatly enhancing competition and increasing the number and quality of services. With the exception of Lebanon, Libya and Syria – which have cellular duopolies under government control- all other MED11 countries have fully competitive cellular markets (with three or more operators). Fixed services lag, however, with only four countries having competitive fixed telephony markets. All studied countries except Libya have competitive Internet markets, most of which are service-based, not infrastructure-based competition. Table 1 shows the status of competition in the ICT market of the MED11 countries.

All the countries, with the exception of Libya, have attracted direct foreign and local private investment in their telecom sectors. In Algeria, the public sector has taken ownership away from foreign investors (probably related to the dispute between the government and Orascom Telecom).

As in the rest of the world, regulators have found it easy to liberalize the cellular markets. Fixed and Internet markets proved to be trickier. For example, in Algeria, the second fixed line operator exited after incurring massive losses. And ILD com-

petition, where it exists such as in Jordan, Israel, Turkey, Morocco, Tunisia and Egypt, resulted in a rapid decline of ILD revenues. But infrastructure-based fixed services competition has not been a stellar success in any of the countries.

Table 1. Status of competition in ICT (2010)

	Cellular	Fixed	Internet
Algeria	Competitive	Monopoly	Competitive
Egypt	Competitive	Monopoly	Competitive
Israel	Competitive	Competitive	Competitive
Jordan	Competitive	Competitive	Competitive
Lebanon	Controlled Duopoly	Monopoly	Competitive
Libya	Controlled Duopoly	Monopoly	Monopoly
Morocco	Competitive	Competitive	Competitive
Palestine	Competitive	Monopoly	Competitive
Syria	Controlled Duopoly	Monopoly	Competitive
Tunisia	Competitive	Monopoly	Competitive
Turkey	Competitive	Competitive	Competitive

Note. Refer to the exhibit 4 in the annex for historical data.
Source: Operators and regulators as compiled by Arab Advisors Group (www.arabadvisors.com).

1.2. Privatization

While most countries opened up their markets to competition, the incumbent operators in more than half of the countries are still controlled by the government. Six countries still have over 50% ownership in the incumbents for fixed and mobile services. Algeria, Lebanon, Libya and Syria have full government ownership and control of the incumbents, while Egypt and Tunisia have majority ownership (80% and 65% respectively). On the other extreme, there are: Turkey and Israel with their telecom operators completely owned and operated by the private sector. Table 2 shows more details.

Table 2. Privatization of telecom operators (2010)

Operator	Government sector	Public sector (indirect government sector)	Private sector
Algeria			
Djezzy	-	-	100%
Nedjma	-	-	100%
Mobilis	100%	-	-

Operator	Government sector	Public sector (indirect government sector)	Private sector
Egypt			
Telecom Egypt	80%	-	20%
Mobinil	-	-	100%
Vodafone Egypt	35.96%		64.04%
Etisalat Misr	-	30%	70%
Israel			
Bezeq (Pelephone)	0%	0%	100%
Cellcom	0%	0%	100%
Partner	0%	0%	100%
HOT Telecom	0%	0%	100%
Barak- Netvision	0%	0%	100%
Jordan (by 2009)			
Zain	0	-	100%
Orange	3%	29%	68%
Umniah	-	4%	96%
Lebanon			
MTC Touch	100%	0%	0%
Alfa	100%	0%	0%
OGERO	100%	0%	0%
Libya			
Libya Fixed	100%	-	-
Almadar Aljadid	100%	-	-
Libyana	100%	-	-
Libya Telecom and Technology	100%	-	-
Aljeel Aljadid	100%	-	-
New Operator (Digicel or Etisalat or Turkcell)	49%	-	51%
Morocco			
Maroc Telecom	30%	0%	70%
Meditel	0%	0%	100%
Wana	0%	0%	100%
Palestine			
Paltel	0%	6.67%	93.33%
Jawwal	0%	6.67%	93.33%
Wataniya Mobile	0%	43%	57%
Syria			
Syriatel	-	-	100%
MTN Syria	-	-	100%
Syrian Telecom	100%	-	-
Tunisia			
Tunisie Telecom	65%	-	35%%
Tunisiana	-	-	100%
Orange Tunisie	-	-	100%

Operator	Government sector	Public sector (indirect government sector)	Private sector
Turkey			
Turk Telecom	30%	-	70%
Turkcell	-	-	100%
Vodafone Turkey	-	-	100%
Avea	-	-	100%

Source: Operators as compiled by Arab Advisors Group (www.arabadvisors.com).

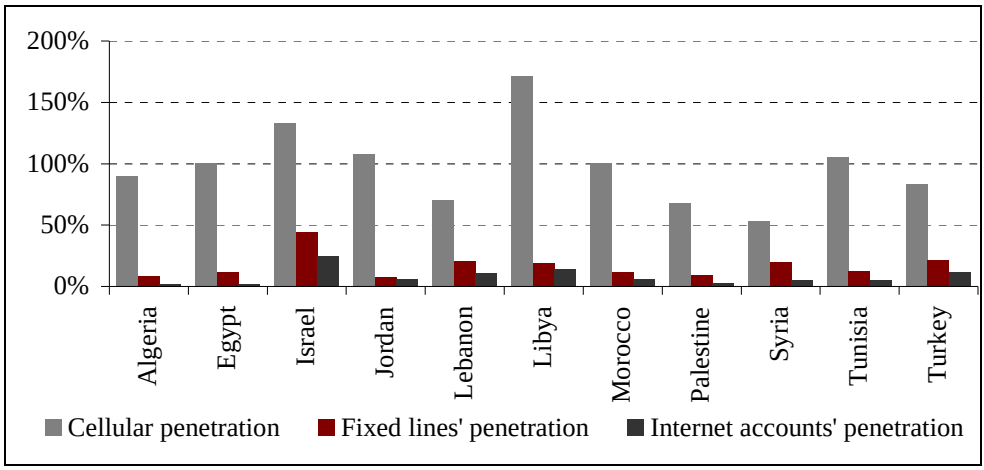
1.3. Telecom coverage status

Taking a close look at the MED11 countries, Libya tops the list in terms of cellular services. By end of 2010, Libya's cellular penetration reached 172% followed by Israel with a 133% cellular penetration rate. Meanwhile, the Syrian market had the lowest cellular penetration rate of 53% by end of 2010. This can be a result of lagging behind other Arab countries in liberalizing the Syrian cellular market.

In terms of fixed telephony, Israel topped the list with 44% fixed lines penetration by end of 2010 and Turkey came in second (22%). Jordan had the lowest penetration rate of 8%; which can be explained by fixed-cellular substitution due to the boom in the low cost prepaid cellular market which gives households an alternative to mainlines.

Table 3. Cellular, fixed and Internet coverage (2010)

	Cellular lines (000s)	Cellular penetration	Fixed lines (000s)	Fixed lines' penetration	Internet accounts (000s)	Internet accounts' penetration
Algeria	32,780	90.3%	3,090^	8.5%	830^	2.3%
Egypt	79,873*	100.6%	9,330	11.8%	1,728*	2.2%
Israel	9,875	133.1%	3,276	44.2%	1,865**	25.1%
Jordan	6,620	108.3%	485	7.9%	346	5.7%
Lebanon	2,841	70.7%	825*	20.5%	440	10.9%
Libya	10,900	171.5%	1,228	19.3%	893	14.0%
Morocco	31,982	100.4%	3,749	11.8%	1,867	5.9%
Palestine	2,754	68.0%	363	9.0%	119	2.9%
Syria	10,954	53.1%	4,069	19.7%	1,100	5.3%
Tunisia	11,114	105.4%	1,290	12.2%	543	5.2%
Turkey	61,770	83.8%	16,201	22.0%	8,562**	11.6%



Notes:
- Refer to Table A1, A2, and A3 in the annex for historical data.
- Penetration rates are calculated as a percent of population.
- Algeria's Internet accounts include the ADSL accounts only.
^ By February 2011.
* Estimated.
** Broadband accounts only.
Source: Regulators, Operators, Arab Advisors Group and ITU.

Israel and Libya topped the list in Internet penetration rates by end of 2010, while Egypt and Algeria came in last with Internet penetration rates of 2% each. Table 3 summarizes the telecom status and coverage for the MED11 countries by end of 2010.

Table 4 shows the "combined" state of cellular, fixed and Internet status of the MED11 countries in 2010. This was done by adding up the cellular lines, fixed lines and Internet accounts of the MED11 countries separately, then dividing each by the combined population for these countries. This resulted in a 93% combined cellular penetration rate, 16% combined fixed lines' penetration rate and 7% combined Internet accounts penetration rate, all by end of 2010.

Table 4. The total ICT services in the MED11 countries 2010

Population (000s)	280,372
Cellular lines (000s)	261,463
Cellular lines' penetration	93.3%
Fixed lines (000s)	43,906
Fixed lines' penetration	15.7%
Internet accounts (000s)	18,292
Internet accounts' penetration	6.5%

Source: Regulators, Operators, ITU and Arab Advisors Group.

Table 5 below compares the MED11 countries in terms of cellular, fixed and Internet status by end of 2009. As in 2010, Libya is on top of the list in terms of the cellular penetration rate while Syria had the lowest rate. Similar to end of 2010 results, Israel topped the list in terms of Internet and fixed penetration rates.

Table 5. Country by country state in the MED11 countries (2009)

	Population (000s)	Cellular subscribers (000s)	Cellular lines' penetration	Fixed lines (000s)	Fixed lines' penetration	Internet accounts (000s)	Internet accounts' penetration
Algeria	35,600	32,951	92.60%	3,076	8.60%	841	2.40%
Egypt	77,702	61,762	79.50%	9,554	12.30%	1,366	1.80%
Jordan	5,980	6,067	101.50%	501	8.40%	245	4.10%
Lebanon	3,966	2,373	59.80%	814	20.50%	370	9.30%
Libya	6,446	9,433	146.30%	1,063	16.50%	772	12.00%
Morocco	31,514	25,311	80.30%	3,516	11.20%	1,188	3.80%
Palestine	3,993	2,124	53.20%	371	9.30%	115	2.90%
Syria	20,124	9,699	48.20%	3,871	19.20%	821	4.10%
Tunisia	10,433	9,754	93.50%	1,279	12.30%	414	3.97%
Turkey	72,561	62,800	86.5%	16,530	22.8%	6,783	9.3%
Israel*	7,244	8,100	111.80%	2,900	40.00%	1,600	22.10%
Total	**258,702**	**223,274**	**86.30%**	**43,475**	**16.80%**	**14,469**	**5.60%**

* By end of 2008.
Source: Regulators, Operators and Arab Advisors Group, ITU.

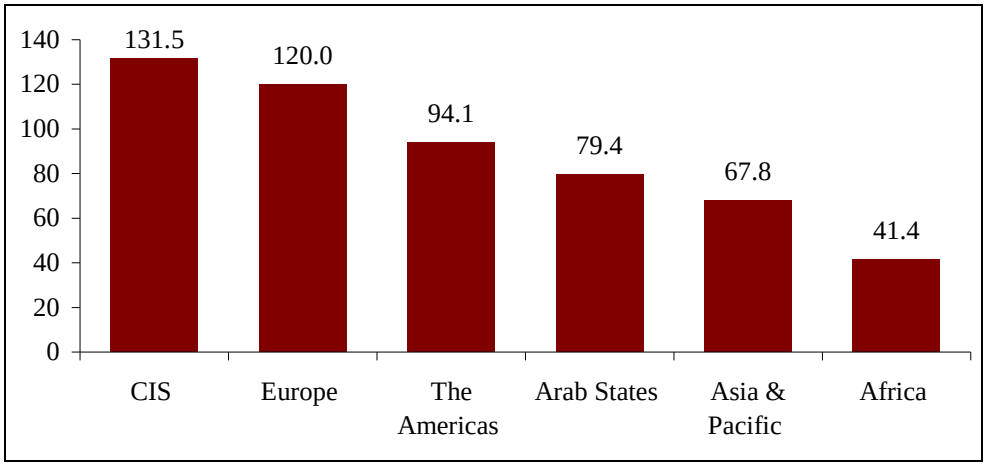
1.4. Comparison with the rest of the World

Compared to other regions, Arab states -which comprise most of the MED11 countries - rank below the Americas and Europe in terms of cellular, fixed and Internet adoption rates. Arab states rank above Africa across all services and above Asia/Pacific in cellular and Internet services penetration. This is explained in more details in the sections that follow.

1.4.1. Cellular coverage and ranking

Despite the fact that there are high cellular penetration rates in some of the MED11 countries, the combined regional penetration rate at 80% is quite low compared to developed markets across the world; in Europe for instance penetration rates are 120%. This is due to the fact that in some countries, quite a large part of the population remains un-served or under-served. Refer to Chart 1 below.

Chart 1. Cellular ranking: subscriptions' estimates per 100 inhabitants (2010)

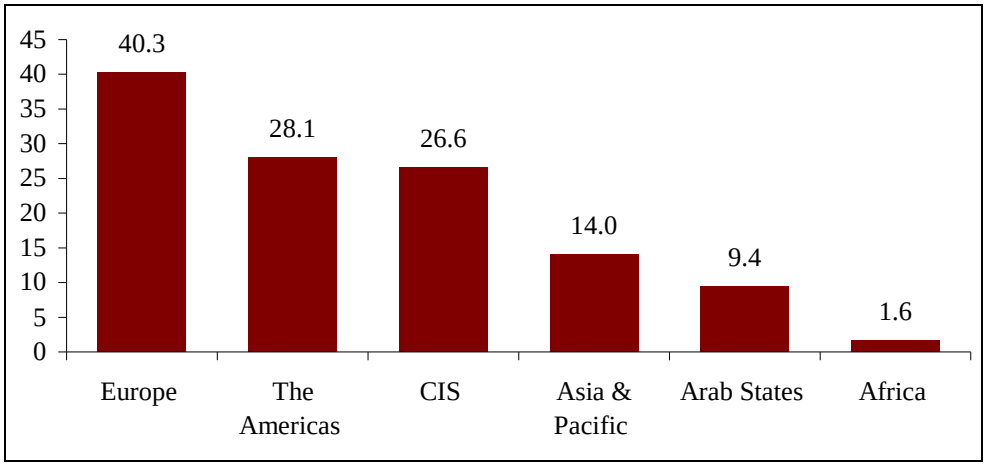


Source: International Telecommunications Union (ITU).

1.4.2. Fixed lines and Internet coverage and ranking

Similar to cellular services Arab States had low fixed telephony and Internet penetration when compared to Europe, the Americas and the Commonwealth of Independent States (CIS). Charts 2 and 3 show the comparisons. Europe had the highest fixed line penetration rate, followed by the Americas, CIS and the Asia & Pacific region. The chart below reveals that fixed line coverage in the Arab States is a quarter of the fixed line coverage in Europe.

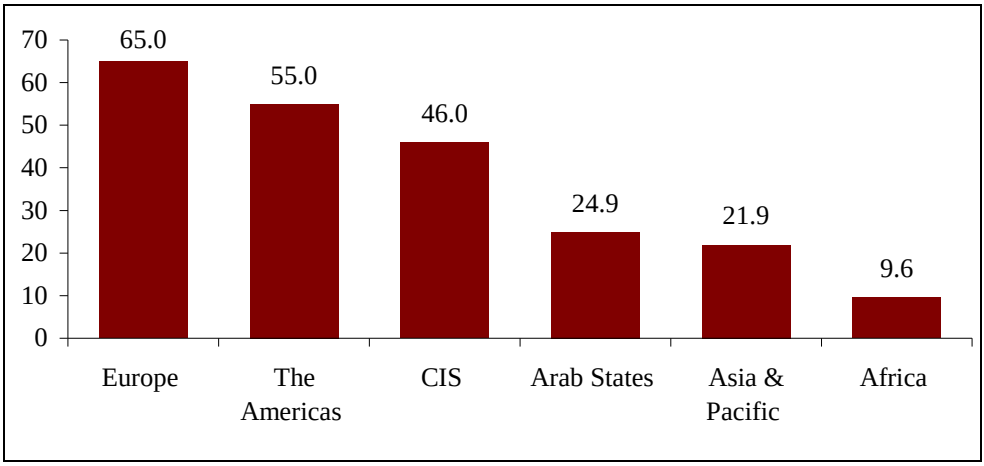
Chart 2. Fixed lines ranking: lines' estimates per 100 inhabitants (2010)



Source: International Telecommunications Union (ITU).

Europe, the Americas, CIS took the lead with respect to Internet users penetration rates. Arab States had higher Internet user penetration rate than the Asia & Pacific region and Africa. The chart below reveals, Internet service coverage in the Arab States is two thirds that of Europe.

Chart 3. Internet users ranking: users' estimates per 100 inhabitants (2010)



Source: International Telecommunications Union (ITU).

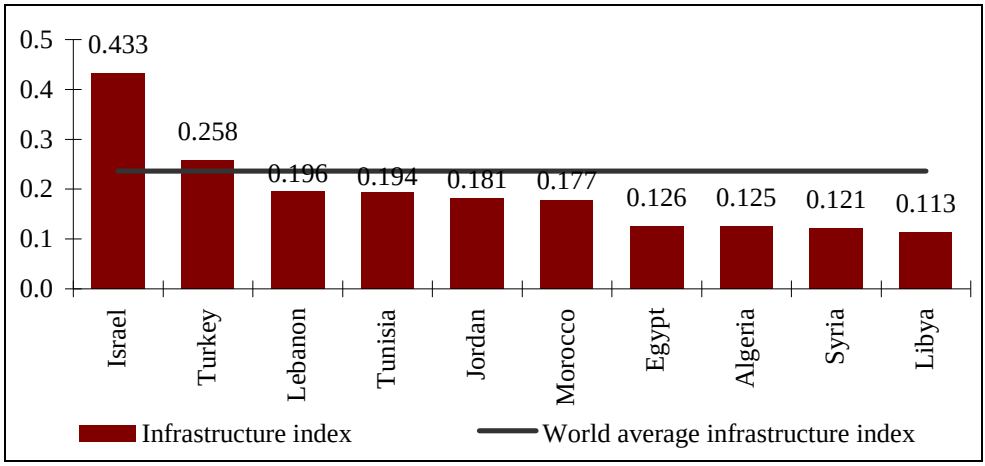
1.5. Infrastructure Index

This section provides a summary of the information mentioned in the previous sections. The summary compares the MED11 countries to the rest of the world with respect to Infrastructure Index, Global e-Government Development Index, Web Measure Index. In addition, this section compares the MED11 countries in terms of e-commerce usage, pricing and Gross Domestic Product (GDP).

The Telecommunication Infrastructure Index is a weighted average index of six indices of a country's ICT infrastructure capacity. These indices are: PCs/1000 persons; Internet users/1000 persons; telephone lines/1000 persons; online population; mobile phones/1000 persons and TV's/1000 persons.

Of the MED11 countries, only Israel and Turkey have indices above the world average of infrastructure index. Israel scored the highest infrastructure index of 0.433 followed by Turkey with an index of 0.258. The remaining MED 11 countries have indices lower than the world average, with Libya having the lowest infrastructure index of 0.113. Refer to Chart 4.

Chart 4. Infrastructure Index (2010)



Note. Palestine was not included in this source.
Source: www2.unpan.org.

1.6. Global e-Government Development Index

The Global e-Government Development Index illustrates the level of development of e-Government services and measures capacity and willingness of individual countries to use e-Government for ICT-led development. Refer to Chart 5.

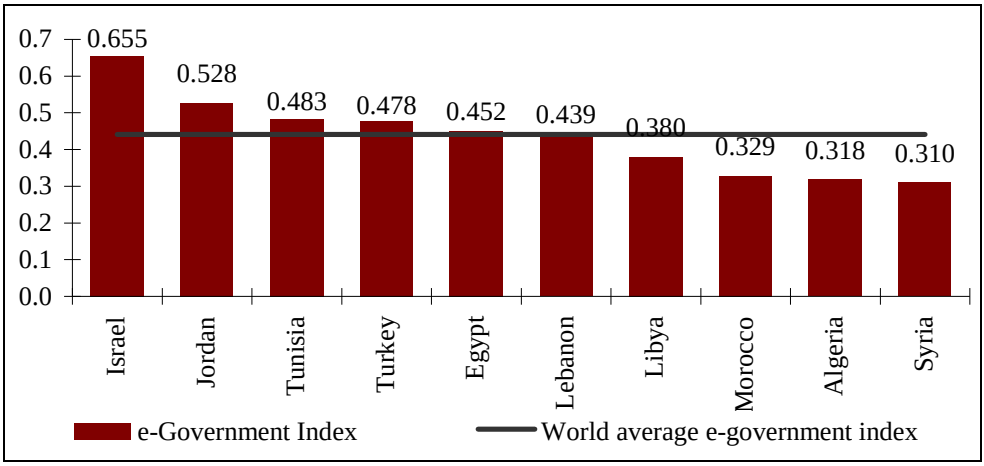
All MED11 countries are moving towards e-services. The level of adoption of e-services varies between these countries. Five of the 11 countries rank above the global average for the e-Government Development Index, a measure created by the UN to assess e-Government initiatives. These are Israel, Jordan, Tunisia, Turkey and Egypt.

A recent report by the Arab Advisors Group compared the main e-Government portals of the Arab MED 11 countries (by November 2010) based on the presence of various features dealing with information availability, service delivery, and public access. Features assessed included: Mobile messaging services, social networking presence, online publications, email registration, user payments, presence of online services and online database availability on the website. The comparison was done for 6 of the Arab MED 11 countries namely: Algeria, Egypt, Jordan, Lebanon, Morocco and Tunisia. This is due to the fact that Syria's government portal was under construction at the time of the research, in addition to the fact that by November 2010, formal e-Government portals were not yet present in Libya and Palestine.

Based on this comparison, all of the analysed portals provide users with online services and an online database. 67% of the portals provide online publications, while, user payments options are offered by 3 of the 6 analysed e-Government portals. Two e-Government portals give the user the option to either register an email account or submit their personal email to receive periodic updates from the government. Furthermore, only 1 out of the 6 analysed e-Government portals provides mobile messaging services. Meanwhile, none of 6 analysed e-Government portals have presence on social networks (such as Facebook and Twitter).

The Arab Advisors Group notes that the most advanced websites among the 6 analysed portals by November 2010 were Morocco and Tunisia.

Chart 5. Global e-Government Development Index (2010)



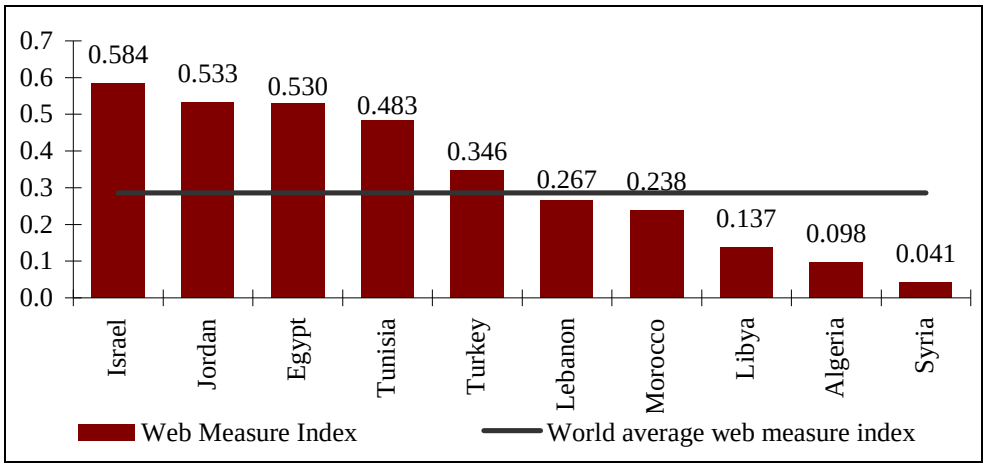
Note. Palestine was not included in this source.
Source: United Nations e-Government Readiness Knowledge Base.

1.7. Web Measure Index

The Web Measure Index illustrates the development of country's e-services which encompass e-commerce and e-government. The e-government index depends on three indices these are: The Web measure index, the Telecommunication Infrastructure index and the Human Capital index. This section analyses the web measure index which measures how developed the country is in terms of e-services. As countries progress on the Telecom and Internet fronts, they are ranked higher in the model. Refer to Chart 6.

According to this ranking, Israel, Jordan, Egypt, Tunisia and Turkey fall above the global average, while Lebanon, Morocco, Libya, Algeria and Syria fall below the average.

Chart 6. Web Measure Index (2010)



Note. Data for Palestine were unavailable.
Source: www2.unpan.org.

The Arab Advisors Group conducted online surveys in Egypt, Jordan and Tunisia. Based on these survey findings, Table 6 below summarizes the percentage of respondents who stated that they use e-Government. It must be noted that the percentages represent the % of Internet users who use e-government services not the whole population. In Egypt, Internet penetration is lower than in Tunisia but it seems that those who use the Internet in Egypt make some good use of the available e-government services in Egypt. Moreover, the high use of some e-government services by Internet users in one country does not necessarily mean that the country has advanced or highly developed e-government services.

Table 6. Internet users' usage of e-Government

Country	Yes	No
Egypt	54%	46%
Jordan	48%	52%
Tunisia	17%	83%

Source: Arab Advisors Group's online surveys.

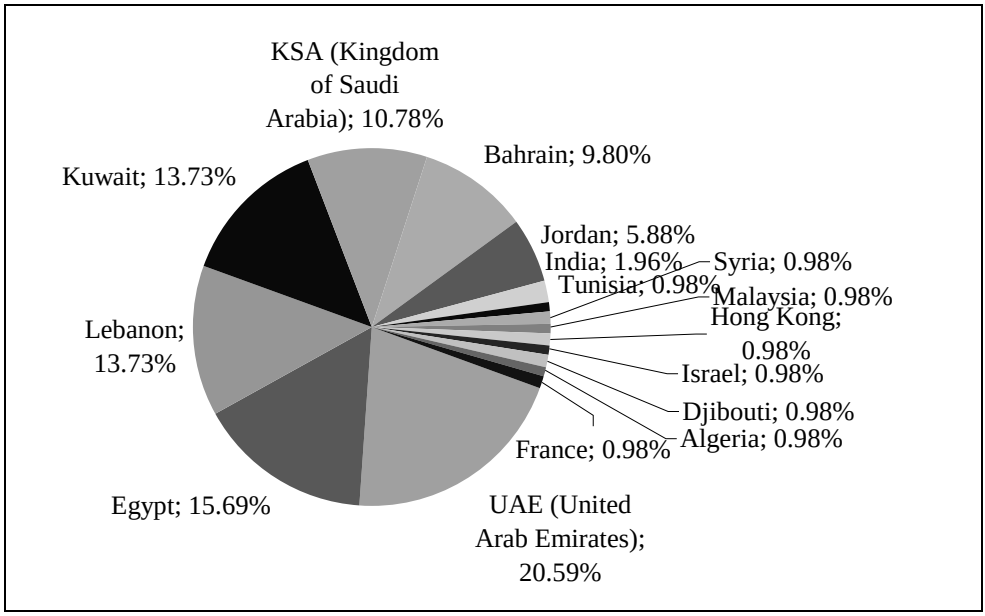
1.8. E-commerce

The Arab Advisors Group defines Electronic commerce, commonly known as E-commerce or e-Business, as the process of buying and selling products or services over electronic systems such as the Internet and other computer networks.

E-commerce is also witnessing its expansion, as evidenced by the increasing number of e-commerce portals in the Arab countries. The availability of alternative payment options such as prepaid cards and phone payments motivate population that is less willing to use credit cards to shop online.

According to Arab Advisors Group's report, UAE and Egypt are home of the largest share of the studied e-commerce portals that target the Arab World, i.e. e-commerce portals that are focused on the Arab World's consumers. Chart 7 below shows the countries of headquarters of these portals by December 2010. The chart reveals increasing interest in targeting the region by e-commerce players located in a wide array of countries in and outside the Arab World. For example, India, France, Israel and Hong Kong host operators that target the MED 11 region at large and the Arab World in particular.

Chart 7. E-commerce portals targeting the Arab World; locations of headquarters (December 2010)



Note. Percentages are calculated from 102 analysed e-commerce portals.
Source: Arab Advisors Group's "E-commerce Portals in the MENA Region", December 2010.

The Arab Advisors Group conducted surveys in Egypt (2010), Jordan (2010), Lebanon (2007), 1948 Arabs (Palestinians who remained in Israel after the 1948 war) (2008), Syria (2010) and Tunisia (2008). Based on these survey findings, the exhibit below summarizes the percentage of respondents who stated that they use e-commerce.

Based on the survey results, Table 7 below shows that e-commerce is more adopted in Egypt (37%) than in the other countries. Tunisia comes second with 36% of the respondents who stated using e-commerce, followed by Jordan (15%). Despite the increased adoption of e-commerce services in the Arab region, it still lags behind when compared with the rest of the world.

Table 7. Respondents usage of e-commerce

	Yes	No
Egypt	37%	63%
Jordan	15%	85%
Lebanon	5%	95%
1948 Arabs	13%	87%
Syria	10%	90%
Tunisia	36%	64%

Source: Arab Advisors Group's surveys.

1.9. Prices and relative pricing status

Arab Advisors Group calculated the "relative pricing status" for the countries. The relative pricing status (High cost, Fair, Low cost) depends on whether the regional status of a country's GDP per capita (the Gross Domestic Product divided by the population) matches that of the regional status of the average minute rate. For example, a country with above-average GDP per capita and above-average minute rate would have fair relative pricing status.

This analysis of post-paid and prepaid tariffs in Arab countries revealed that Morocco had the highest cellular rates, while Egypt had the lowest across both subscription types. As the table reveals, the differences in pricings are quite high between the countries and has more to do with the competitive situation in each country more than the income levels of its citizens. (Table 8 and 9). It must be noted that this analysis is of the published rates and does not include the promotions, offers of unlimited calls to specific numbers, seasonable offers, on-net traffic as opposed to off-net traffic. While the measure of Average revenue per minute (ARPM) is indeed a better and more accurate measure of the relative prices in

each country, but these data are not available as not all operators would share this data and change frequently as a result of seasonal promotions and offers. However, it must be noted that the ARPM in virtually all countries will also be lower than the simple average rates.

Table 8. Postpaid average minute rates (March 2010)

Country	Postpaid average peak and off-peak minute rate (US$)	Regional status	GDP per capita (US$)	Regional status	Relative pricing status
Morocco	0.21	Above average	2,603	Below average	High cost
Palestine(1)	0.15	Above average	1,195	Below average	High cost
Palestine(2)	0.13	Above average	1,195	Below average	High cost
Lebanon	0.12	Above average	7,574	Below average	High cost
Tunisia	0.12	Above average	3,958	Below average	High cost
Jordan	0.10	Below average	3,416	Below average	Fair
Algeria	0.08	Below average	4,588	Below average	Fair
Syria	0.08	Below average	2,508	Below average	Fair
Egypt	0.04	Below average	1,777	Below average	Fair
Average	0.10		3,202		
Median	0.10		2,603		
Minimum	0.04		1,195		
Maximum	0.20		7,574		

Note. The average, media, minimum and maximum are calculated from the rates of 18 Arab countries covered by Arab Advisors Group (Libya was excluded as reliable information on postpaid rates could not be collected).
(1) The rates include the off-net minute rates of Jawwal and Wataniya with the Israeli operators.
(2) The rates do not include the off-net minute rates of Jawwal and Wataniya with the Israeli operators.
Source: "Cellular Rates in the Arab World: A Regional Comparison 2010", April 2010.

Table 9. Prepaid average minute rates (March 2010)

Country	Prepaid average peak and off-peak minute rate (US$)	Regional status	GDP per capita	Regional status	Relative pricing status
Morocco	0.48	Above average	2,603	Below average	High cost
Lebanon	0.36	Above average	7,574	Below average	High cost
Palestine(1)	0.18	Above average	1,195	Below average	High cost
Tunisia	0.15	Below average	3,958	Below average	Fair
Libya	0.15	Below average	15,952	Above average	Low cost

Country	Prepaid average peak and off-peak minute rate (US$)	Regional status	GDP per capita	Regional status	Relative pricing status
Palestine(2)	0.14	Below average	1,195	Below average	Fair
Algeria	0.12	Below average	4,588	Below average	Fair
Syria	0.12	Below average	2,508	Below average	Fair
Jordan	0.07	Below average	3,416	Below average	Fair
Egypt	0.05	Below average	1,777	Below average	Fair
Average	0.18		4,477		
Median	0.15		3,010		
Minimum	0.05		1,195		
Maximum	0.48		15,952		

Note: The average, media, minimum and maximum are calculated from the rates of the 19 Arab countries covered by Arab Advisors Group.
(1) The rates include the off-net minute rates of Jawwal and Wataniya with the Israeli operators.
(2) The rates do not include the off-net minute rates of Jawwal and Wataniya with the Israeli operators.
Source: "Cellular Rates in the Arab World: A Regional Comparison 2010", April 2010.

Table 10. Total annual costs of 1024 Kbps ADSL as a % of GDP per capita (September 2010)

Country	GDP per capita (2009)	Total annual cost (US$)	Annual cost as a % of GDP per capita
Algeria	3,937.70	300.7	7.60%
Egypt	1,903.00	295	15.50%
Jordan	3,831.00	393.4	10.30%
Lebanon	8,706.00	1,047.10	12.00%
Morocco	2,949.00	137.9	4.70%
Palestine	1,141.00	508	44.50%
Syria	2,646.70	681	25.70%
Tunisia	3,806.00	236.9	6.20%
Average	3,615	450	15.8%
Median	3,378	347	11.2%
Minimum	1,141	138	4.7%
Maximum	8,706	1,047	44.5%

Source: Arab Advisors Group.

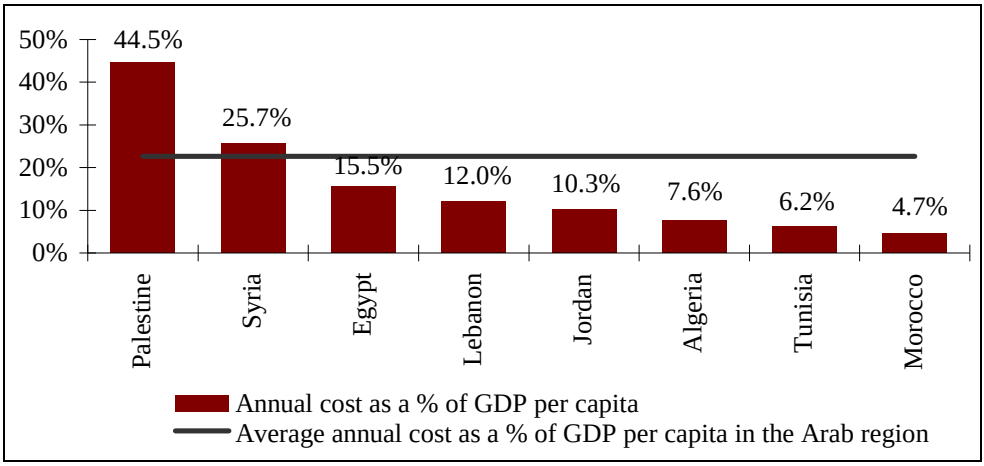
As for the Internet market, the Arab Advisors Group compared rates for the speeds of 512, 1024 and 2048 Kbps. The analysis revealed that the 1024 Kbps speed is the most common speed offered in the Arab region. Lebanon had the

highest rates for 1024 Kbps (12% of per capita GDP) while Morocco had the lowest rates (4.7% of per capital GDP).

The ratio presented in Table 10 is column 2 (total annual cost) divided by column 1 (GDP per capita), therefore, the ratio is a measure of relative cost (cost of broadband as a % of GDP per capita). A high ratio would indicate that the broadband cost is quite high relative to the GDP per capita in the country making its unaffordable for large sections of the population. The lower the ratio, the more affordable the service is.

This calculation indicates that Palestine had the most expensive service relative to GDP (44.5%), followed by Syria (25.7%), Egypt (15.5%), Lebanon (12.0%), Jordan (10.3%), Algeria (7.6%), Tunisia (6.2%) and Morocco (4.7%).

Chart 8. Average Total annual costs of 1024 Kbps ADSL as a % of GDP per capita



Notes:
Total annual cost is calculated by adding the connection fees and yearly subscription fees. The Arab Advisors Group assumes that the connection fees are amortized over the first year of subscription. The effective total monthly cost is calculated by dividing the total annual cost by 12.
The average, media, minimum and maximum are calculated from the rates of 18 Arab countries covered by Arab Advisors Group as the only ISP in Libya (LTT: Libya Telecom and Technology Company) does not offer the 1024 Kbps speed.
Source: “ADSL Rates in the Arab World: A Regional Comparison 2010”, October 2010.

2. Forward looking analysis

Economists have done extensive academic research on the effects of a well developed telecom and broadband infrastructure on any country's social and economic well being.

As multiple studies have shown (of the World Bank and others) increase in ICT penetration levels (whether Internet or cellular) lead to enhanced economic growth with a clear positive effect on GDP and poverty alleviation. For example, the World Bank conducted an analysis to test the impact of telecommunications penetration on economic growth rates at country-level.[1] According to the analysis of 120 countries, for every 10 percentage point increase in the penetration of mobile phones, there is an increase in economic growth of 0.81 percentage points in developing countries, versus 0.60 percentage points in developed countries. This was confirmed by a study by Lee et a. (2009)[2]. Dr. Mona Badran (2011) has done a similar study in the context of the Arab world and her results also showed positive GDP growth correlated with enhanced penetration levels of telecom services[3]. Examples of the beneficial impact of mobile phone penetration are numerous. For instance, a cellular line in the hands of farmers or fishermen helps them to follow market prices which allow them to sell their production for the best possible price rather than be locked into what the middlemen in their villages can offer. Similarly, a reliable Internet connection would allow a translator to expand his potential client base to the whole world rather than his immediate neighbourhood. The studies also found that all information and communications technologies promote growth more effectively in developing countries than in developed ones. This is because telecommunications services help improve the functioning of the markets, reduce transaction costs and increase productivity through better management in both public and private sectors. Additionally, reliable broadband connectivity is a

[1] Qiang, C. Z. W., 2009. Telecommunications and Economic Growth, World Bank, Unpublished paper. Qiang, C. Z. W., Rossotto, C.M., 2009. Economic Impacts of Broadband, in Information and Communications for Development 2009: Extending Reach and Increasing Impact, World Bank, Washington D.C.

[2] Lee, S., Levendis, J., Gutierrez, L., 2009. Telecommunications and economic growth: an empirical analysis of sub-saharan Africa, Universidad del Rosario, Facultad de Economa.

[3] Badran, M., 2011, The impact of broadband infrastructure on economic growth in Egypt and some Arab and emerging countries, Cairo University, Faculty of Economics and Political Science.

major prerequisite for export oriented service industries such as call centres, outsourcing and financial services.

Broadband is considered a general purpose technology, which is a prerequisite for many vital services, and is a necessary condition for innovation and growth worldwide. For example, Dr. Mona Badran (2011), who prepared a detailed study of the impact of broadband adoption in Egypt, states that broadband Access to the Internet is considered by many economists and policy makers as the way to achieve knowledge based economy. This is mainly because broadband and telecom at large create an enabling environment for businesses and governments, improves overall productivity and creates jobs.

The telecom sector itself is a major job creator as telecom operators create direct jobs and create indirect jobs through their massive retail networks. In addition the sector is a major tax generator for the governments (through income taxes, revenue sharing and sales taxes). It has also proven to be a sector that is quite malleable to major foreign direct investment (FDI) flows.

The telecom sector (including broadband) avails the platform for economic development in other sectors. It allows for efficient communication which is essential for businesses. Reliable connectivity is a prerequisite for strong and viable financial, manufacturing and services-based businesses. Moreover, it is responsible for generating a whole new eco-system of broadband-dependent businesses that include major success stories like Google, Skype, Ebay, Amazon, Facebook, Twitter that resulted in major job creation in the US and globally. The importance of the social networks have clearly shown their importance on enhancing transparency and social mobilization during the Arab Spring in 2011 even during periods where government controlled media were restricted. To the extent that they contributed to enable these social and political changes they will have made a positive contribution to promoting better governance and improved business environment

To sum up, ICT development, deployment and expansion has a major immediate effect on job creation and enhancing aggregate demand in any economy and possibly to improved governance. Competition is vital to not only the telecom's sector growth, but it is vital to the development of the whole economy per se. It has been observed that competition in telecom industry induces innovation, reduces their costs and prices and mostly improves quality of service on the long run.

In the ICT area, the countries are at varying degrees (stages) of market "sophistication". We would define a sophisticated ICT market as the one that is competitive and offers liberalized telecom services with multiple large operators (at least three to four) without dominance of one operator in any segment and with effective participation of the private sector. Such a market would have ample and redundant international connectivity through multiple routes and technologies (ex-

ample: Terrestrial Fiber Optics (FO), terrestrial microwave, submarine FO, satellite, etc.). It would operate under a well structured and effective regulator that ensures competitiveness and service standards. With a favourable investment climate it would attract the necessary financing at competitive costs. Of course, sustained economic growth would underpin the development of the ICT sector. Furthermore, multiple factors affect the level of ICT sophistication. They include the legal structures of the country and degree of respect of rule of law. Invariably, a consistent application of laws in any country, and a fair and independent and efficient judiciary, all contribute to enhancing business trust in the country and would encourage foreign and local investments. Unfortunately, the analyzed countries vary significantly in judiciary independence and rule of law.

A favourable institutional, political and economic situation would greatly enhance the chances that the optimistic scenario (discussed in Table 12) will be achieved in the MED region. We believe that an "Ideal" political context is a prerequisite for a fully sophisticated ICT sector. Such an ideal context would mean fully democratic system of government with free press and periodical elections that are free and fair leading to rotation of power and governmental changes and a growing economy that attracts both foreign and local investments with inflation under control and a strong independent central bank (with economic growth dividends being fairly distributed and shared and resulting in continued reduction in poverty levels and unemployment levels). Such a context would enhance the regulatory framework for ICT and drive uptake of advanced ICT services, engender investments in ICT and technologies which would be a virtuous cycle that benefits a sophisticated and expanding ICT sector. Oppositely, political strife and unrest can make the ICT sector as one of its early victims.

In 2011, Israel and Turkey lead in sophistication of ICT markets in the MED11. The countries' ICT market sophistication coincides with favourable business climate as measured by the Ease of Doing Business rankings (of the World Bank) (Table 11). A good business climate is vital in attracting investments in the ICT sector. As shown in the table below Israel tops the charts with a rank of 30 and 29 in 2010 and 2011 respectively, followed by Tunisia and Turkey. The remaining MED11 countries lag behind with ranks that range between 94 and 144. Algeria and Syria ranked the lowest out of the MED11 countries with ranks of 136 and 144 respectively.

Jordan, Morocco, Egypt and Tunisia follow Israel and Turkey when it comes to market sophistication with these countries being pioneers in market liberalization amongst Arab countries. Algeria and Palestine are the next in terms of sophistication of the ICT market followed by a distant Syria and Lebanon. Libyan ICT market remains the least sophisticated and is still a subject of central governmental planning. The region lags evidently in development of the broadband markets. For

example, Syria continues to fall way behind in terms of broadband penetration despite pent-up demand evident in popularity of dialup Internet (it has very high costs of broadband and limited broadband infrastructure).

Table 11. "Ease of doing business" rank

Country	2011	2010
Israel	29	30
Tunisia	55	58
Turkey	65	60
Egypt	94	99
Jordan	111	107
Lebanon	113	109
Morocco	114	114
Algeria	136	136
Syria	144	144
Libya	NA	NA
Palestine	NA	NA

Source: www.doingbusiness.org/rankings.

Illustrative scenarios

Looking into the next 20 years we may distinguish between three illustrative regional scenarios: pessimistic, steady state and optimistic. Table 12 provides the key factors that would drive these various scenarios and illustrative outcomes. Countries following the "optimistic" scenario would have a positive impact on their own economic development as noted above.

Scenarios would probably coincide with upgrade of the MED region on the World Bank "Ease of Doing Business" scale. For instance, in the optimistic scenarios, countries which currently fall below the MED average could move up and the ones above the average move to situation closer to the "optimal" situation. This would raise the regional average. In the pessimistic scenario, the Doing Business indicators would slip in the region at large, while these indicators would remain unchanged under the steady state scenario.

It should be realized though that, as in the past, progression on the IT adoption scale will also be influenced by technologically driven factors that are reflected in technological innovations that will impact on the easy of IT adoption and use by the citizens of the country and on lowering costs. These factors are likely to continue to operate somewhat independently from the business environment, and the

degree of integration with particular trading partners such as the EU; factors that are given great importance in the scenario building exercises of other foresight scenarios undertaken under the MEDPRO project.

Country conditions impact the extent to which they favour the adoption and deployment of existing ICT services and those that will be made available in the future as a result of the technological changes. Table 12 shows the various factors that are likely to influence the outcome of ICT deployment. It distinguishes between a pessimistic, steady state and optimistic scenario. As noted above these three scenarios will impact differently on the growth and employment performance of the individual countries and the MED region in general.

Table 12. A "gaze" into the future: Three scenarios for 2030

	Middle income countries average in 2010	**Pessimistic case**	**Steady state**	**Optimistic case**
		Investment climate deteriorating	Investment climate not improving	Stability and democracy across the region and a group of cooperating countries are in peace with each other and cooperating in a regional framework. Investment climate improving
Factors impacting on the ICT sector and outcomes and outcomes in the regional context				
Investment climate		Deteriorating. Region attracts lower investments than its true potential.	On average not much change. Performance in individual countries varies .	Improving results in the region attracts investments at a high rate.
Regulatory institutions. This includes the state of rule of law, the judiciary, transparency and fairness.		Deteriorating	Stable but not optimal	Optimal (This optimal context would be fully democratic system of government with free press and periodical elections that are free and fair leading to rotation of power)
Government openness to par-		Low in most countries	Largely unchanged	High in all countries

	Middle income countries average in 2010	Pessimistic case	Steady state	Optimistic case
ticipation of citizens in public affairs			Diverse across countries	
Outcomes for 2030				
Regional Penetration rate mobile	80%	75%	110%	170% (already many countries have this penetration; in the region, UAE and Saudi Arabia, for example)
Regional Penetration rate Fixed	12%	10% down from	20%	25%
Regional Penetration rate Internet (accounts NOT users) As a rough measure, each account serves an average of 3-5 users	4%	4%	12%	20%
Broadband adoption		Low (less than 20% of households). 60% of total Internet connections	Fair (50% of households) 90% of total Internet connections	High (more than 70% of households) 99% of total Internet connections
FTTH (Fiber to the Home) deployment		Low (less than 5% of broadband)	Fair (25%-30% of broadband)	High (40-60% of broadband)
E-commerce adoption		Low (less than 10% of Internet users)	Fair (50% of Internet users)	High (more than 80% of Internet users)
Technical training in-country on ICT issues?		Low	Good	High
E-governance (e-government services)		Low. Little e-gov services and few Internet users using them	Slow progress in line with past. Varies across countries. 50% of Internet users using e-gov	Substantial improvement over steady state with over 80% of Internet users using e-gov

3. Concluding remarks and the role of the EU

The region has lagged behind in terms of market liberalization of its telecom sector. For example, MENA (Middle East and North Africa) has been ranked as the most restrictive region in trade of fixed telecom services among a group of Asian and transition economies according to a recent World Bank report (Sustaining the Recovery and Looking Beyond dated January 2011).[4] Yet this could change fairly rapidly as more countries adopt liberalization policies and good governance that would attract Foreign Direct Investment (FDI) and expand the markets. Being a laggard may actually avail some benefits, as countries adopt best practices and learn from the pitfalls of earlier liberalizers!

As the southern neighbours of the EU (European Union), the MED11 countries should benefit from Europe's interest and support in the region at large, thus contributing the realization of the optimistic scenario. Good governance, growth, stability would contribute to the prosperity of both the region and Europe. The EU could have a positive role by supporting institutional reforms and encouraging trade and investments with the MED11 region. Also support to improve various domestic factors that impact on the investment climate, as measured in the World Bank Doing Business Indicators, would enhance the chances that the "optimistic scenario" be realized. As other part of the MEDPRO research project have indicated, there is much to be gained from moving from the shallow, tariff reducing approach to integration to a 'deep" integration that selectively aims at lifting other growth impeding elements of the institutional framework. In the process, the EU should steer away from "dictating" a road map, but rather act as a friend of the region, with a vested interest in the regional stability and prosperity.

[4] World Bank , 2011, Sustaining the Recovery and Looking Beyond- A Regional Economic Developments and Prospects Report.

Annex 1. ICT regional comparison

Table A1. Cellular coverage (2005 – 2010)

	2005	2006	2007	2008	2009	2010
Cellular lines (000s)						
Algeria	13,492	20,998	27,563	27,031	32,951	32,780
Egypt	12,585	17,716	30,640	43,601	61,762	79,873
Jordan	2,883	3,930	4,771	5,436	6,067	6,620
Lebanon	999	1,104	1,205	1,451	2,373	2,841
Libya	1,162	3,460	5,290	7,466	9,433	10,900*
Morocco	12,393	16,005	20,029	22,816	25,311	31,982
Palestine	1,092	1,217	1,327	1,537	2,124	2,754
Syria	3,144	5,005	6,882	7,790	9,699	10,954
Tunisia	5,681	6,709	7,842	8,569	9,754	11,114
Turkey	43,600	52,700	62,000	65,800	62,800	61,770
Cellular penetration %						
Algeria	40.6%	62.1%	80.4%	77.0%	92.6%	90.3%
Egypt	17.6%	24.3%	41.2%	57.3%	79.5%	100.6%
Jordan	52.7%	70.2%	83.4%	92.9%	101.5%	108.3%
Lebanon	26.6%	29.0%	31.2%	37.1%	59.8%	70.7%
Libya	20.0%	58.0%	86.5%	118.6%	146.3%	171.5%
Morocco	41.1%	52.5%	64.9%	73.2%	80.3%	100.4%
Palestine	30.7%	33.3%	35.3%	39.6%	53.2%	68.0%
Syria	17.3%	26.7%	35.9%	39.7%	48.2%	53.1%
Tunisia	56.6%	66.3%	76.7%	83.0%	93.5%	105.4%
Turkey	63.6%	75.9%	88.3%	92.6%	86.5%	83.8%

Source: Regulators, Operators and Arab Advisors Group, ITU.

Table A2. Fixed lines coverage (2005 – 2010)

	2005	2006	2007	2008	2009	2010
Mainlines (000s)						
Algeria	2,572	2,841	3,068	3,069	3,076	3,090*
Egypt	10,400	10,808	11,229	11,703	9,554	9,330
Jordan	628	614	559	519	501	485
Lebanon	673	680	727	800	814	825
Morocco	1,341	1,266	2,394	2,991	3,516	3,749
Palestine	349	341	350	358	371	363
Syria	2,903	3,243	3,453	3,633	3,871	4,069
Tunisia	1,257	1,268	1,273	1,239	1,279	1,290
Turkey	18,980	18,830	18,200	17,490	16,530	16,201

	2005	2006	2007	2008	2009	2010
Mainlines penetration %						
Algeria	7.7%	8.4%	8.9%	8.7%	8.6%	8.5%
Egypt	14.6%	14.8%	15.1%	15.4%	12.3%	11.8%
Jordan	11.5%	11.0%	9.8%	8.9%	8.4%	7.9%
Lebanon	17.9%	17.9%	18.9%	20.5%	20.5%	20.5%
Morocco	4.4%	4.2%	7.8%	9.6%	11.2%	11.8%
Palestine	9.8%	9.3%	9.3%	9.2%	9.3%	9.0%
Syria	16.0%	17.3%	18.0%	18.5%	19.2%	19.7%
Tunisia	12.5%	12.5%	12.4%	12.0%	12.3%	12.2%
Turkey	27.7%	27.1%	25.9%	24.6%	22.8%	22.0%

* By February 2011.
Source: Regulators, Operators and Arab Advisors Group.

Table A3. Internet coverage (2005 – 2010)

	2005	2006	2007	2008	2009	2010
Internet accounts (000s)						
Algeria	220	355*	490*	691	841*	830^
Egypt	951	968	1,099	1,205	1,366	1,728
Jordan	130	160	200	229	245	346
Lebanon	200	220	260	315	370	440
Morocco	262	400	526	758	1,188	1,867
Palestine	80	107	102	108	115	119
Syria	219	315	636	724	821	1,100
Tunisia	150	179	253	281	414	543
Turkey	1,590	2,865	4,609	5,986	6,783	8,562
Internet accounts penetration %						
Algeria	0.7%	1.1%	1.4%	2.0%	2.4%	2.3%
Egypt	1.3%	1.3%	1.5%	1.6%	1.8%	2.2%
Jordan	2.4%	2.9%	3.5%	3.9%	4.1%	5.7%
Lebanon	5.3%	5.8%	6.7%	8.1%	9.3%	10.9%
Morocco	0.9%	1.3%	1.7%	2.4%	3.8%	5.9%
Palestine	2.2%	2.9%	2.7%	2.8%	2.9%	2.9%
Syria	1.2%	1.7%	3.3%	3.7%	4.1%	5.3%
Tunisia	1.5%	1.8%	2.5%	2.7%	4.0%	5.2%
Turkey	2.3%	4.1%	6.6%	8.4%	9.3%	11.6%

^ By February 2011 and includes only ADSL accounts.
* Arab Advisors Group Estimates.
Source: Regulators, Operators and Arab Advisors Group.

Table A4. Status of competition in ICT (2005 – 2010)

	2005	2006	2007	2008	2009	2010
Fixed						
Algeria	Duopoly	Duopoly	Duopoly	Duopoly	Monopoly	Monopoly
Egypt	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly

	2005	2006	2007	2008	2009	2010
Israel	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Jordan	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Lebanon	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly
Libya	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly
Morocco	Monopoly	Duopoly	Competitive	Competitive	Competitive	Competitive
Palestine	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly
Syria	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly
Tunisia	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly
Turkey	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Cellular						
Algeria	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Egypt	Duopoly	Duopoly	Competitive	Competitive	Competitive	Competitive
Israel	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Jordan	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Lebanon	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly
Libya	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly
Morocco	Duopoly	Duopoly	Duopoly	Competitive	Competitive	Competitive
Palestine	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Syria	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly	Controlled Duopoly
Tunisia	Duopoly	Duopoly	Duopoly	Duopoly	Duopoly	Competitive
Turkey	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Internet						
Algeria	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Egypt	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Israel	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Jordan	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Lebanon	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Libya	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly
Morocco	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Palestine	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Competitive
Syria	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Tunisia	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive
Turkey	Competitive	Competitive	Competitive	Competitive	Competitive	Competitive

Source: Operators.

Annex 2. Countries overview

Algeria.

Regulatory framework

There are three independent telecommunication regulatory bodies in Algeria:

The Autorité de Régulation de la Poste et des Télécommunications (ARPT): The ARPT is an independent regulatory entity; legally and financially. The public establishment is in charge of regulating both the post and telecommunications markets. The Chairman and Members of the Board are appointed by the President of the Republic.

The regulatory authority prepares its own interior regulations. The interior regulations of the regulatory authority defines its organization, operating rules, rights and obligations of the chair and the members of the board; in addition to the status of personnel.

Members of the council may not work at any other public occupations, nor hold any other governmental positions. Members of the council may not possess any direct or indirect interests or stakes in companies in the postal, telecommunications, audiovisual, data and information technologies sectors.

The Ministère de la Poste et des Technologies de l'Information et de la Communication (MPTIC): A governmental department that is responsible for selling and awarding licenses. Along with ARPT, the MPTIC is responsible for ensuring effective competition between all licensed post and telecommunication operators. The MPTIC is also responsible for announcing the withdrawal of a license from an operator, as suggested by the regulatory authority (ARPT).

The Agence Nationale des Fréquences: Its responsibilities include allocating frequencies, preparing national regulations, procedures and national plans concerning the allocation of frequencies, in addition to planning and monitoring the usage of the national frequency spectrum.

Fixed market

Algerie Telecom Group is currently the monopoly fixed operator in Algeria after its competitor, Lacom, seized business in late 2008. Algeria's fixed lines base

is growing very slowly. By end of 2009, total mainlines stood at around 3.1 million lines. The mainline penetration rate in Algeria stood at 9%.

Cellular market

Strong competition exists between the three GSM operators (Djezzy, Mobilis and Nedjma). Algérie Telecom is the only integrated operator offering fixed, cellular and Internet services. Mobilis launched the first 3G trial network in Algeria of W-CDMA standard.

Algérie Télécom Mobile (Mobilis); is the incumbent cellular operator in Algeria which started its GSM services in 1999. The second cellular operator -Orascom Telecom Algérie SPA (Djezzy) - commenced its operations in February 2002, however, currently, there are some negotiations going on regarding the sale of Djezzy due to issues related to tax reassessments from the Algerian direction des Grandes Enterprises (DGE) in respect of years 2004-2009.The Algerian government has expressed its interest in buying Djezzy. The third GSM license was granted to Wataniya Telecom Algérie (Nedjma) in December 2, 2003, the operator announced the launch of its GSM network under the commercial name “Nedjma” on August 25, 2004.

Algeria’s cellular operators served a total of nearly 33 million lines which reflected in a cellular penetration rate of 93% by end of 2009 against 15% in 2004; where the number of lines was 4.9 million. The Arab Advisors Group estimates that by end of 2010, the total number of subscribers will reach around 33.5 million.

Internet Market

The Internet market in Algeria is competitive. By end of 2009 there were 73 Internet Service Providers (ISPs) in Algeria. By end of March 2010, Algeria’s ADSL accounts amounted to 650,000 accounts.

Egypt

Regulatory framework

The National Telecommunications Regulatory Authority (NTRA) was established in accordance with the provision of Law No. 10, for the year 2003 'the Tel-

ecommunications Regulation Law' as a national authority to administer the telecommunication sector, considering transparency, open competition, universal service and protection of user rights as a general outline for NTRA scope of work. The chairman of the board of the NTRA is the Minister of Communication and Information Technology. Other board members include representatives from Ministry of Defense, Ministry of Finance, Ministry of Interior Affairs and Ministry of Media.

Fixed market

Telecom Egypt is the monopoly fixed operator in Egypt. The Egyptian regulator (NTRA) was in the process of offering the second fixed license in the country. On September 9, 2008, the NTRA officially announced postponing the tender, this came after the NTRA announced that the ICT international markets are facing major fluctuations due to the increasing inflation rates and prices. By September 2010, fixed lines reached 9.400 million lines, resulting in a mainline penetration rate of 11.9% by the end of the period.

Cellular market

Mobinil (shareholders are Orascom Telecom and Orange) started operations in May 1998. Competition commenced with the entrance of Vodafone Egypt in the same year. Competition was boosted in May 2007 with the entrance of Etisalat Misr to the market as the first 3.5G operator. By December 2010, the three cellular operators offered 3G services.

Egypt's cellular operators added more than 12.2 million subscribers in the first nine months of 2010. The Arab Advisors Group estimates that Egypt’s total market cellular lines have reached 74.022 million. This growth was reflected in a cellular penetration rate of 93.7% by September 2010.

Internet Market

The Internet market in Egypt is competitive. ISPs licenses in Egypt are divided into three categories: Class A license, Class B license and Class C license. To date, the regulator issued four carrier Internet licenses (Class A) and eight data service providers licenses (Class B), in addition to 212 service-based ISPs’ licenses (Class C). The three classes' licensees (A, B and C) can provide ADSL services in Egypt. The difference between the licenses is that a Class A licensee can buy

international bandwidth from Telecom Egypt (at favourable carrier to carrier rates), have its own international gateway for data through Telecom Egypt, and collocate DSLAMS for ADSL service on unbundled copper wires. The exhibit below reveals the internet licensing regime in Egypt.

By June 2010, ADSL lines reached 1.190 million; a 15.9% (163,123 lines) increase; resulting in an ADSL penetration of 1.52% by the end of the period.

Table A5. Internet licensing regime in Egypt

License Class	Scope of the license	Licensed ISPs
A	Class A Licensee may buy its own international bandwidth and deploy its own DSLAMS.	Link Egypt, TE Data, Egy Net, Nile online
B	Class B licensee may obtain international bandwidth from a Class A licensee and resell to other service providers.	Equanet, Noor communications, Raya Telecom, Yalla, Egy Net, Menanet, Soficom, Batelco
C	Provide IP services to end users through facilities obtained from class A licensees.	212 ISPs

Source: NTRA, ISPs.

Israel

Regulatory framework

The Ministry of Communications is the regulatory body of telecommunications in Israel. The ministry was established in 1971 (it was the ministry of posts since 1952). Responsibilities of the ministry include managing and administering the electromagnetic spectrum and the numbering resource, approving usage of telecommunications equipment in Israel and formulating telecommunications regulations. It is also responsible for implementing policies that encourage competition in the telecommunications market.

The Ministry of Communications is administered and supervised by the Minister of Communications, which directly supervises both the “Council for Cable & Satellite Broadcasting” and the Director General. The management of Israel’s frequency spectrum assets is the responsibility of the ministry’s Spectrum Management & Frequency Licensing division. For its part, the operators licensing ac-

tivity is controlled by the Engineering and Licensing division, while all legal actions of the Ministry are handled by its Legal Advisors Bureau.

Cellular market

Four operators are present in the Israeli market; Cellcom, Pelephone communications, Partner and MIRS.

The cellular market incumbent is Pelephone, which started operations in 1994. The second license was granted by the end of 1994 to Cellcom. Orange (Partner communications), the third cellular operator in the Israeli market, entered the market in 1998. The fourth cellular operator, MIRS, which uses iDEN ESMR technology, entered the Israeli market in 2001.

By Q3 2010, Cellcom was the main player in the Israeli market, with around 3.376 million subscribers, Partner came second with 3.133 million subscribers, followed by Pelephone (2.825 million subscribers), and then MIRS which targets a limited, niche market.

Cellcom, Partner and Pelephone offer 3G services. By Q3 2010, Cellcom had 1.114 million subscribers to its 3G services, representing 33% of its total customers. For its part, Partner had 1.491 million 3G subscribers representing 48% of its total subscriptions, while Pelephone's 1.775 million 3G subscribers represent 63% of its total subscribers.

By the end of 2009, the Israeli cellular market had a total of around 9.6 million subscribers, translating into a penetration rate of 127%.

Fixed market

The incumbent fixed operator in the Israeli market is the Israeli Communications Company (Bezeq). Bezeq was granted the license in 1984.

Six operators are present in the Israeli fixed market; Bezeq, HOT Telecom (a triple play operator that is a result of a merger between a number of cable companies), 012 Telecom, Cellcom Fixed Telecommunications services, Partner Fixed Telecommunications services and Globcall.

According to reports from the MOC, Israel had 2.9 million direct exchange lines as of 2008, using a 100% digital network (approximately 87% owned by Bezeq, the incumbent local exchange carrier, and 13% by other carriers, mainly HOT). Fixed lines penetration rate was 39.3% by the end of 2008.

Internet market International telecommunications services markets

By 2008, there were 5 large Internet service providers in Israel, in addition to over 50 smaller license holders. The five major ISPs are 012 Smile, Bezeq International, Barak- Netvision, HOT Telecom and Golden lines.

The Ministry of Communications reports that Bezeq began to offer ADSL services in the year 2000. Wireless Internet was introduced to the Israeli market in 2001 by the cellular operators, while broadband modem access was introduced by cable companies in 2002.

Bezeq and HOT Telecom are obligated to provide universal deployment of broadband Internet access service. Other ISPs purchase international IP bandwidth, connect to the networks of Bezeq and HOT Telecom, and provide services to consumers based on a VPN connection.

By 2008, there were more than 3 million Internet users in the Israeli market translating into a penetration rate of 41%; these include more than 60% of the households and more than 80% of businesses. Reports from the MOC indicate that the number of ADSL subscribers by 2008 was over 1 million. For their part, cable modem subscriptions amounted to over 600,000.

As for the international telecommunications services, the outgoing fixed international telephone traffic amounted to 1.6 billion minutes in 2007. The figure for incoming traffic was 1.3 billion minutes.

Jordan

Regulatory framework

The Telecommunications Regulatory Commission (TRC) is the telecommunications regulatory body in Jordan (answerable to the Prime Minister). The TRC is a financially and administratively independent juridical personality.

The TRC is administered and supervised by a Board (Board of Commissioners), composed of five full-time members appointed by a resolution of the Council of Ministers, upon nomination by the Prime Minister based on the recommendation of the Minister. The TRC performs its duties independently of the Ministry of Telecommunications and Information Technology, but in compliance with the general policy of the government. The Minister, with the approval of the Prime Minister, may select two persons to represent specific governmental entities to

participate in meetings of the board of commissioners, but without having the right to vote.

Fixed market

By November 2010, Orange was the only PSTN (Public Switched Telephone Network) service operator (other competitors provide prepaid calling cards - none is operational in PSTN service provision). Jordan is competitive in the fixed ILD (International Long Distance) market; in addition there are ongoing Fiber Optic (FO) projects.

Jordan's PSTN lines base is shrinking. By H1 2010, the number of mainlines dropped by 1,900 lines, to end the period with 499,300 mainlines. The mainline penetration in Jordan stood at an estimated 8.3% by end of June 2010.

Cellular market

Strong competition exists between the three GSM operators (Zain, Orange and Umniah). Zain is the incumbent in the Jordanian cellular market. Jordan Mobile Telephone Services Company (JMTS/Zain) was founded in September 1995, with an operating license valid for 15 years. Competition commenced with the entrance of MobileCom (now known as Orange) in the year 2000, and was boosted in June 2004 with the entrance of XPress (iDEN) to the market. Later in 2005, the market welcomed another GSM player, Umniah. On October 15, 2010, Xpress (in coordination with the TRC) announced that it has suspended its cellular services due to difficult financial conditions, leaving the Direct connect (Push-to-talk), XGPS and interconnect receiving calls to Amman and Aqaba only. Orange Mobile was the first to launch 3G services in Jordan on March 3, 2010. In 2010, Jordan's Telecom regulator, the TRC, granted Zain Jordan the second 15-year third generation (3G) license. The operator's 3G services are expected to be commercially launched in the first half of 2011.

Jordan's cellular operators added around 388,000 lines during the first nine months of 2010 to serve a total of 6.455 million lines. This growth was reflected in a cellular penetration rate of 106.2% by end of September 2010.

Internet Market

The Internet market in Jordan is competitive. By end of 2009, there were 19 operational ISPs in Jordan, namely: Orange, Zain ISP, Umniah (including Batel-

co), MEC, NEXT, Cyberia, IONET, TEdata, Viacloud, Sama, Tarasol, wi-tribe, JCS, Nuegroup, Kulacom, Blink, Mada Jordan, Stream, and VTEL. Five of the 19 ISPs provide WiMAX services, these are: Umniah, wi-tribe, Zain ISP, Kulacom, Mada Jordan.

By July 2010, Jordan's ADSL accounts amounted to 182,600 accounts, constituting 36.6% of total mainlines. The ADSL penetration rate stood at 3.0% by July 2010 compared to 2.8% by the end of 2009. In the first half of 2010, Jordan's WiMAX accounts increased to stand at 69,000 accounts by the end of the period.

Lebanon

Regulatory framework

The Telecommunications Regulatory Authority (TRA) is the telecommunications regulatory body in Lebanon (answerable to the Minister of Posts and Telecommunication). The TRA is a public institution with its own legal personality.

The TRA is administered and supervised by a Board, composed of members appointed by decree of the Council of Ministers, upon proposal by the Minister of Posts and Telecommunication. While all board members of the TRA come from a private sector background, decisions taken by the TRA board are required to be approved by the Minister.

Fixed market

OGERO is the monopoly fixed operator in Lebanon. Due to the high prices of international calling services in Lebanon, numerous VOIP services are available in the country –illegally, as these are considered theft of the state's money. VoIP does not refer to individual/residential use; although it could also be illegal for individuals, but the governments usually only pursue groups who sell VoIP services. Moreover, due to the dated fixed network in Lebanon, there are no Next Generation Network or Intelligent Network services such as fixed SMS, Toll Free Calling and Collect Calls.

By end of September 2010, the number of mainlines in Lebanon reached 824,000 lines. By the end of the period, the mainline penetration in Lebanon stood at an estimated 20.6%.

Cellular market

Lebanon's cellular market is served by a duopoly controlled by the government. Lebanon's two cellular networks are operated through management contracts between the government and regional operators Orascom Telecom and Zain Group, Orascom Telecom operates Alfa, while Zain Group operates MTC Touch.

Alfa and MTC Touch added around 356,863 lines during the first nine months of 2010 to serve a total of 2.73 million lines. This growth was reflected in a cellular penetration rate of 68.1% by Q3 2010.

On February 1, 2010, the Lebanese government renewed both operators' contracts for six months until July 31, 2010. On May 31, 2010, the government renewed the contracts for an additional three months until October 31, 2010 followed by another extension until January 31, 2011.

Internet Market

The Lebanese Internet market is competitive. By end of 2009, there were 17 licensed and operational ISPs in Lebanon, namely: Broadband Plus, ComNet, FarahNet, Fiberlink Networks (NewCom), IDM, Keblon, Lebanon OnLine, Masco Group, Moscanet (Wise), Onet Plus, Pro Services, Sodetel, Solidere, Terranet, Transmog (Cyberia), Tri Network Consultants and Virtual ISP (VISP).

In addition, there are seven operational DSPs (out of nine DSP licensees) in Lebanon, as follows: Cable One, Cedarcom, GDS, Pesco, Waves SAL, TRISAT SARL, LCNC SAL, Sodetel and Solidere. Four of the nine DSPs provide WiMAX services, these are: Cable One, Cedarcom, GDS and Pesco.

On the broadband front, Lebanon had an estimated 160,000 broadband accounts by October 2010, of which around 30,000 are wireless broadband accounts (Pre-WiMAX) and the remaining accounts are all DSL lines. It is worth noting that ADSL services were introduced in Lebanon in 2007, which is late relative to other countries in the region.

Libya

Regulatory framework

The General Telecommunications Authority (GTA) is the telecommunications regulatory body in Libya. The GTA has its own Board of Directors which does not

enjoy full independence in setting regulations. Its Secretary General is Muhammad Muammar Al Gaddafi, son of Libya's president, who approves all the decisions.

The state owned Libyan Post, Telecommunication and Information Technology Company is the owner company of all the operating telecommunications companies of Libya. The holding company exercises a light-handed authority over its subsidiaries, where it is primarily asked to approve key decisions only.

A number of cellular; fixed and Internet players are expected to be introduced to the Libyan market in 2011 (Table A6).

Table A6. Libyan upcoming telecom entrants in 2011

Operators	License status	Services	Ownership
Libya Telecom and Technology	Licensed	MVNO*	state-owned
Aljeel Aljadid	Licensed	MVNO* Fixed services Internet services	
New Operator (Digicel or Etisalat or Turkcell)	Not licensed yet (winner to be announced soon)	Cellular services Fixed services	Privately owned

* MVNO (Mobile Virtual Network Operator): Which is an operator who enters the cellular market and competes with existing operators, however it does not own its own infrastructure, it actually makes agreements with one of the cellular operators with extra or unutilized infrastructure and acts as a reseller but with its own brand, packages and prices.
Source: Operators, Regulator.

Fixed market

The General Post and Telecommunications Company (GPTC), established in 1984, was the sole operational provider of fixed services in Libya. In 2009, the company was devised into three companies that operate the fixed services industry, namely: Libya Post (responsible for postal services in Libya), Libya Fixed (responsible for local fixed telephony), Libyan International Telecommunications Company (responsible for International Long Distance telephony). The companies operate in different vertical and horizontal layers of the value chain under which no competition between any exist.

Cellular market

Almadar Aljadid and Libyana are the only operational cellular operators in Libya. Almadar Aljadid –the incumbent- started operations in 1997, while the second mobile operator – Libyana- launched its cellular services in September

2004. In September 2006, Libyana announced the launch of its 3G services in the capital Tripoli.

The Libyan cellular subscribers' base grew by 26.34% in 2009 to reach 9.433, with a penetration rate of 146%. Libyana continued to be the dominant operator with a 70.48% market share by end of 2009.

Internet Market

Libya Telecom and Technology (LTT) is the sole operational government owned ISP in Libya, established in 1997.

Morocco

Regulatory framework

The ANRT (Agence Nationale de Réglementation des Télécommunications) is the legal entity responsible for regulatory issues governing telecommunications activity in Morocco. The ANRT's mission is regulating, monitoring and arbitrating the communications sector in Morocco.

The ANRT is an independent institute in Morocco. It has a board of directors where its members are assigned by decree. Other than the chairman of the board, the members are usually governmental and private sector representatives. Decisions are taken by vote; at least two thirds of the board members should be present in order to take decisions.

Fixed market

Three operators serve Morocco's fixed line market: Maroc Telecom (the incumbent), Meditel, and Wana. Maroc Telecom was the sole provider of fixed line services, until Meditel commenced its fixed-line services in November, 2006. The third entrant, Wana entered Morocco's fixed line market in February 2007.

Morocco's fixed market reached a total of around 3.706 million fixed lines by end of September 2010 (a growth rate of 5.4% over 2009). The fixed lines penetration stood at an estimated 11.7%.

Cellular market

Maroc Telecom was the only operational cellular operator till March 29, 2000, when Médi Télécom (Méditel) started providing its services in the country. The third entrant –Wana- offered its cellular voice services over its 3G network (based on its existing national CDMA2000 1xEV-DO network) in July 2008. Later on February 23, 2010, Wana commercially launched its 'Inwi' 2G-GSM brand in the Moroccan market.

The three cellular operators in Morocco ended September 2010 with 30.503 million lines up from 25.311 million by end of 2009. The penetration rate reached an estimated 96% by end of September 2010.

Internet Market

By June 2010, six ISPs owned the Internet infrastructure in Morocco: Maroc Telecom, Meditel, Wana, Golsat, Semicom and Spacecom. Golsat, Semicom and Spacecom are VSAT (Very Small Aperture Terminal) providers.

The Arab Advisors Group divides the Internet accounts in Morocco into fixed Internet accounts and mobile Internet accounts (presented in the 3G accounts). Morocco's fixed Internet market totalled to 486,888 accounts with a penetration rate of 1.53% by end of September 2010. Mobile Internet accounts reached a total of 1.2 million by end of September 2010.

By September 2010, Maroc Telecom had the highest market share of the total fixed Internet accounts in Morocco (98.82%). Meanwhile, Wana had the highest market share of the mobile Internet service of 42.7% by end of September 2010.

Palestine

Regulatory framework

The Ministry of Telecom & IT (MTIT) in Palestine regulates the telecommunication, IT and Post sectors. Following decree number (3) of 1996, the MTIT of Palestine regulates and manages the wireless and cable telecommunication networks and is responsible of setting the telecommunication policies after getting the approval of the Board of Ministries. It is also the authorized body to grant the li-

censes, determine their conditions, and approve their tariffs. (i.e.: Hence, there isn't an interdependent body in Palestine that regulates the Telecom sector).

The minister is the decision maker in Palestine's Telecom sector. A Group of Consultants help the minister in taking decisions according to the telecom law. If the Palestine monopoly operator of the fixed line, Paltel, intends to raise its prices or set a new pricing policy, the ministry should approve this policy.

Fixed market

Palestine Telecommunications Company (Paltel) is the monopoly fixed operator in Palestine. Paltel reported a total of 405,947 fixed lines by end of September 2010 – a growth of 9.5%. Fixed lines estimated penetration reached 9.9% by end of September 2010.

Cellular market

Jawwal and Wataniya Palestine in addition to the four Israeli cellular operators (Pelephone, Cellcom, Orange and MIRS) serve the Palestinian territories. Jawwal started operations on October 2, 1999. The second cellular operator -Wataniya Palestine- launched its operations in November 2009. Wataniya Palestine's license avails it the right to establish, manage and operate a second and a third generation (2G, 3G) networks in addition to international services by means of its own international facilities.

Palestine's total estimated cellular market penetration rate stood at 63% by end of September 2010. The Arab advisors Group estimates that Jawwal, Wataniya Mobile and the four Israeli operators exceeded 2.57 million lines by end of September 2010 (in the Palestinian territories).

Internet Market

Before October 10, 2010, Paltel was the only ISP in Palestine with all the ISPs acting as resellers to Paltel. On the aforementioned date, the MTIT in Palestine enacted the Bit Stream Access (BSA) model in West Bank. BSA enables ISPs to offer their end users Internet services using Paltel's ADSL access and core infrastructure.

Currently, there are 39 ISPs operating in the West Bank under the old model and 10 ISPs under the new BSA model. ISPs operating under the old model are not allowed to add new subscribers. The 10 ISPs operating under the new model

are: Jinan, Call U, Cool Net Internet Services Provider, Mada Al Arab,Fusion, Vision Technology, Al Zaitounah For Telecommunications, Gemzo communication and Information Technology, Hadara and Super Link.

Palestine's incumbent operator, Paltel, reported reaching a total of 116,700 Internet accounts by end of September 2010 down from 114,718 accounts by end of 2009.

Syria

Regulatory framework

By December 2010, Syrian Telecom was the telecom regulator in Syria. However, on June 9, 2010, the Syrian Parliament enacted a new telecom law in Syria, establishing a new regulatory body in Syria, by February 2011, the new law was not applied yet. Accordingly, Syrian Telecom will be a joint-stock company, owned by the government offering fixed and Internet services. Reportedly both Syriatel and MTN Syria will transform their BOT contracts into licenses.

The new telecom regulatory body will be responsible for all the telecommunications aspects in Syria. It will be financially and administratively independent and answerable to the Minister of Telecommunications. The regulator will constitute of:

Board of Commissioners: It will consist of seven members (including the Chairman of the Board and his Deputy). The members shall have experience and specialized in the fields of Telecommunications and Information Technology, economy, law, and administration. All members must be holding the Syrian Arab nationality. The presence of private sector in the board is not mentioned in the law.

Executive Body: The members of the executive body will be assigned later by a decree by a Council of Ministers based on proposal of the Minister of Telecommunications.

Fixed market

Syrian Telecom is the monopoly fixed operator in Syria. Syrian Telecom owns the infrastructure in the country.

Fixed lines in Syria increased by 128,000 during the first nine months of 2010. Fixed lines reached a total of 4 million subscribers by the end of the period .The country's penetration rate increased to reach 19.52% by end of September 2010.

Cellular market

By December 2010, Syriatel and MTN Syria were the two mobile operators controlled by Syrian Telecom, operating under the BOT agreement. Syriatel was established in 2001 after obtaining the BOT agreement from Syrian Telecom to establish a network covering Syria. MTN Syria is the second cellular operator in Syria which commercially launched its services on March 1, 2001 .

In September 2010, the Ministry of Communications and Technology announced the tender for the third mobile license in Syria. Five companies were prequalified for the license, these are: Emirates Telecommunications Corporation – UAE, Saudi Telecom Company – Saudi Arabia, Qatar Telecom QSC – Qatar, Turkcell Iletisim Hizmetleri A.S.– Turkey and France Telecom – France. The Ministry scheduled the winner of the license to be announced in April 2011.

The Syrian cellular market added 882,000 lines during the first nine months of 2010. Syria's total cellular lines reached close to 10.6 million by the end of September 2010, with a penetration rate of 52%.

Internet Market

The Internet market in Syria is competitive. By end of June 2010, there were 13 operational ISPs in Syria, namely: Syrian Telecom (190.sy and Tarassul), Aya, SCS, Sawa, INTE, Rannet, Tarnet, Elecom, Syriatel, Zaad, MTN Syria and Best Italia (satellite Internet provider). Syria's Internet market added 147,981 accounts during the first six months of 2010 to reach 968,887. The penetration rate reached 5% by the end of the period.

Tunisia

Regulatory framework

The Ministry of Communication Technologies along with the National Telecommunication Commission (Instance Nationale des Télécommunication -INT)

and the National Agency for Frequencies (ANF) are responsible for the regulatory framework of the telecom market in Tunisia .

The Ministry is mainly in charge of licensing. The INT is responsible for arbitration and handling of disputes between the operators and overseeing the interconnection framework, while the ANF is responsible of controlling and managing the frequencies. The three entities are independent; nevertheless, the Ministry of Communications remains the regulatory umbrella. It is worth mentioning that after the revolution in Tunisia January 14, 2011, the Minster of Communications was dismissed and the Ministry became a Secretary of State under the Ministry of Industry for next 2 months.

Fixed market

Tunisie Telecom is the monopoly fixed operator in Tunisia. However, Orange Tunisie obtained its fixed and 2G/3G Mobile Telecommunication license (from the Ministry of Communication Technologies) on June 22, 2009 to operate fixed and mobile telecommunications (2G and 3G services). The new operator is planning to launch fixed and Internet services but did not declare any dates.

Tunisia's fixed lines market slightly grew during the first nine months of 2010. Fixed lines increased by 4,052 lines to reach around 1.28 million by end of September 2010. The meagre growth of fixed lines slightly decreased the country's penetration rate to an estimated 12.20% by end of September 2010 down from 12.26% year-end 2009.

Cellular market

Competition exists between the three GSM operators (Tunisie Telecom, Tunisiana and Orange Tunisie). Tunisie Telecom is the incumbent in the Tunisian cellular market. Tunisie Telecom introduced Tunisia's first GSM network in 1998. By December 2010, Tunisie Telecom was the only integrated operator offering fixed, cellular and Internet services.

Tunisiana is the second mobile operator in Tunisia. Tunisiana commercially launched its operations on December 27, 2002. The third entrant -Orange Tunisie launched its 3G and cellular services on May 5, 2010. Orange Tunisie introduced 3G for the first time in Tunisia and had one-year of exclusivity from the date of license. Accordingly, Tunisie Telecom obtained its 3G license on September 21, 2010 but has not launched the service yet.

The three Tunisian cellular operators reported adding 1.4 million cellular lines during the first nine months of 2010. By end of September 2010, Tunisia's cellular lines reached 11.1 million; increasing the country's cellular penetration to 105.8%.

Internet Market

The Internet market in Tunisia is competitive. By December 2010, there were 11 operational ISPs in Tunisia, six are government owned: ATI, INBM, CCK, CIMSP, IRESA and FSI de al Défense. The remaining five are private owned ISPs: Planet Tunisie, 3S Global Net, Hexabyte, Topnet and Tunet.

Tunisia's ADSL accounts grew solidly during the first nine months of 2010. The Tunisian market reported adding 131,239 new accounts to reach 498,777 by end of September 2010. Tunisia's ADSL penetration reached 4.75% by the end of September 2010.

Turkey

Regulatory framework

The Information and Communication Technology Authority is the regulatory body in Turkey in charge of all aspects related to the communications and Internet markets (e.g. competition rules, consumer rights, quality of service, pricing, spectrum and frequency, conciliation procedures… etc) in line with Turkey Telecommunications Law.

The Information and Communications Technology Authority in Turkey is an independent entity which is headed by a Board of Directors, consisting of: Board Members a Chairman, Vice President and a Committee Member. Decisions are taken through an outlined voting process in accordance with Turkey's Telecom Law.

Fixed market

According to the regulator, Turkey hosts a sum of 19 fixed service operators. Those operators own an authorization by rights of use. Oger Turk Telekom is the incumbent operator which was privatized to Oger Telecom in November 2005.

According to the regulator, the number of fixed subscribers reached 16.5 million with a penetration rate of 22.8% by end of 2009.

Cellular market

According to the regulator, Turkey hosts a competitive cellular market with three operators; Turkcell, Vodafone and Avea. 3G licenses were issued and granted to the three cellular operators in 2009. Turkcell is the incumbent operator which started Turkey's first GSM network in February 1994. On December 13, 2005, Vodafone won a public auction to purchase Telsim (founded in 1994). The old Telsim brand was phased out on 31 March 2007 in favour of Vodafone. The third cellular entrant –Avea- was officially established on February 19, 2004.

As reported by the Turkish regulator, mobile subscribers reached 62.8 million with a penetration rate of 87% by end of 2009. 3G subscribers exceeded 7 million in 2009 with the authorization of 3G services in July 2009. The market shares of Turkcell, Vodafone and Avea are 56%, 25% and 19%, respectively.

Internet Market

According to the Turkish regulator, Turk Telekom’s infrastructure serves ISPs in Turkey for the provision of broadband services via bit stream access. Turkey hosts a sum of 103 Internet service providers. Those providers own an authorization by notification. The total Internet accounts reached 6.78 million by end of 2009. It is worth mentioning that 92% of the Internet accounts are ADSL accounts.