

**Government of Qatar
Planning Council**

Qatar Knowledge Economy Project

**Turning Qatar into a Competitive Knowledge-
Based Economy**

Knowledge Economy Assessment of Qatar

May 21, 2007

Turning Qatar into a Competitive Knowledge-Based Economy: Opportunities and Challenges

Qatar has experienced a remarkable economic and social development over the last 30 years. Qatar's economic policy has been focused on developing its vast oil and natural gas reserves with considerable success. However, with many energy projects in hand, the Qatari government is seeking to diversify its economy and aiming at directing a growing part of the public and private investments into non-energy sectors.

Qatar is devoted to develop its economy towards a knowledge-based economy enriching its level of human capital and improving its competitiveness. Knowledge, as it is applied in innovation and entrepreneurship, research and development, product design and software, and in how people use their education and skills, is now considered to be one of the key sources of sustained growth in the global economy.

In this context, the Planning Council of Qatar and the Qatar Foundation have in this context asked the World Bank to help them in carrying out a knowledge economy assessment of Qatar as well as in formulating a knowledge-based economy vision as part of Qatar's National Vision 2025.

Qatar is already implementing a number of knowledge economy measures and projects but many of these projects were initiated without an overall coherent long-term vision developed with inputs from key stakeholders. It is intended that Qatar will develop an ambitious knowledge economy vision to mobilize enthusiasm and common energies across the nation, and bring consistency to existing and new initiatives. This vision will be concretized by detailed plans promoting economic incentives and governance frameworks that support a knowledge-based economy and by investments in key pillars of the knowledge-based economy: education and learning, innovation, and information technologies.

The knowledge economy assessment of Qatar is mainly based on background reports on the pillars of the knowledge economy prepared by the Qatar Planning Council and the Qatar Foundation (please see the list of references), as well as on a generic knowledge economy assessment using the Knowledge Assessment Methodology (KAM) indicators developed by the World Bank and benchmarking methodologies and indicators developed by other international organizations.

Separate chapters are devoted to each of the specific knowledge economy pillars. They suggest issues and questions for discussion to identify strengths and weaknesses in Qatar's readiness for moving towards a knowledge-based economy. The knowledge economy assessment report of Qatar will be discussed by key policy-makers, strategic planners and representatives from the private sector and civil society at a workshop on

“Turning Qatar into a Competitive Knowledge-Based Economy”, January 15-17, 2007 in Doha, Qatar.

The report contains seven chapters. Chapter 1 gives a short overview of Qatar’s current economic context. Knowledge economy policy agendas cannot be disconnected from the overall macroeconomic and political conditions and reforms. Chapter 2 gives a brief overview of Qatar’s overall knowledge economy readiness using the KAM indicators.

Chapters 3 to 6 include an assessment of the four interlinked knowledge economy pillars that are essential for helping Qatar to make effective use of knowledge for its development:

- *An appropriate economic incentive and institutional regime* that encourages the widespread and efficient use of local and global knowledge in the economy, that fosters entrepreneurship, and that permits and supports related social transformations;
- *A society of skilled, flexible and creative people*, with opportunities for quality education, jobs and life-long learning available to all;
- *A dynamic information and telecommunication infrastructure*, that provides efficient services and tools available to all sectors of society; and
- *An efficient innovation system* comprising firms, science and research centers, universities, and other organizations that can tap into and contribute to global knowledge, adapt it to local needs, and use it to create new products and services.

At this stage, no policy recommendations will be put forward on how to improve Qatar’s readiness for the knowledge economy. The discussion of recommendations will take place at the workshop in Qatar on January 15-17, 2007. Chapter 3-6 do, however, propose issues and questions that could guide the discussions on how to turn Qatar into a competitive knowledge-based economy

Chapter 7 concludes with the overall prospects of turning Qatar into a competitive knowledge-based economy.

1. The current economic context

Qatar has experienced high economic growth over the last five years. It is now one of the richest countries in the world measured in GDP per head at an estimated 40,400 \$US at PPP in 2007. The population of Qatar is around 900,000 of which approximately 25 per cent are Qatari citizens. 75 per cent of the population are expatriates of different nationalities and many are long-term residents. The largest expatriate communities are from India, Pakistan and Bangladesh. There is also a sizeable community of Egyptians and other non-Gulf Arabs.

According to the Economist Intelligence Unit's forecasts (Table 1.1), Qatar's economy is expected to remain high performing in terms of economic growth at around 9 percent in real terms, as continued rapid expansion of Qatar's liquefied natural gas (LNG) industry and the coming of new oil capacity result in steep increases in exports volumes. Output of associated condensates will also expand, and there will be sustained growth in the other gas-based industrial ventures as projects under development reached completion, notably in the petrochemicals sector.

The oil and gas sector is the mainstay of the Qatari economy, accounting directly for an estimated 60 % of GDP in 2004, while manufacturing, the bulk of which is related to oil and gas downstream operations, accounted for about 10 % of GDP. That Qatar is still very dependent on oil and gas activities is also illustrated by the fact that Qatar Petroleum's (owned by the State of Qatar) total contribution to economic activity well exceeds 50 % of GDP, and Qatar Petroleum and its foreign partners account for almost all of Qatar's exports.

With the current relatively high oil and natural gas prices on world markets, Qatar's current account surplus has remained high. According to Standard & Poor, it was equivalent to 29.6 % of Qatar's GDP in 2004 and should be even higher in 2006-07, at about 36 to 44 % of GDP. Those significant surpluses have implied that the public debt has been significantly reduced to an estimated 25.9 % of GDP in 2007.

Although crude oil remains Qatar's largest single export, Qatar has established itself as one of the world's leading exporters of LNG with almost 80 million tones a year of capacity as well as gas-to-liquids (GTL) production at more than 300,000 barrels a day. According to Standard & Poor's assessment, the present oil reserves in Qatar (27 billion barrels) should last for at least 95 years. Furthermore, the current estimated natural gas reserves of 906 trillion cubic feet, could last for about 200 years at the current pace of production.

As Qatar has oil and gas for many years to come, it is a reasonable assumption that, in the absence of a major downward adjustment of energy prices, its economy will remain strong. Furthermore, the production cost of gas in Qatar is one of the lowest in the world and continues to decrease.

Table 1.1: Economic structure of Qatar 2001- 2007

	2001	2005 ¹	2007 ²
Nominal GDP (\$US m)	17.741	33.230	45.626
GDP (% real change from last year)	4.5	8.8	8.9
Population and income			
Population (m)	0.6	0.7	0.9
Labor force (m)	0.4	0.5	0.5
GDP per head (US\$ at PPP)	31,898	38,137	40,403
Unemployment rate %	3.9	3.2	3.1
Ratios, GDP at factor costs (%)			
Agriculture % of GDP	0.4	0.2	0.1
Industry % of GDP	69.1	79.4	81.2
Service % of GDP	30.5	20.5	18.7
Public debt (%)	79.8	38.0	25.9
Consumer prices (% change from last year)	1.4	8.8	6.2
Goods exports fob \$US	10.871	21.863	33.072
Goods imports fob. \$US	3.386	9.891	15.323

Source: The Economist Intelligence United: Country Risk Service Qatar, June 2006.

¹ Economist Intelligence Unit Estimate

² Economist Intelligence Unit forecast

Qatar can tap into a number of strengths as it seeks to build a knowledge-based economy. It has presently high macroeconomic stability and growth as well as relatively high political stability and consensus. Qatar has furthermore considerable economic surpluses that it can invest to improve its readiness for the knowledge economy. The economic stability is however depending on the fluctuation in natural gas and oil prices at the world market.

Qatar has already invested heavily in education, health, construction and infrastructure projects that will help sustain high growth levels as the consumers spending caused by the rapidly growing population in Qatar.

However, so far these investments have been largely uncoordinated, without a nationwide vision for Qatar's future, and are often heavily dependent on foreign know-how and skills. Qatar is therefore seeking to establish a sustainable knowledge economy by diversifying its economy and to be less dependent on importing knowledge and skills.

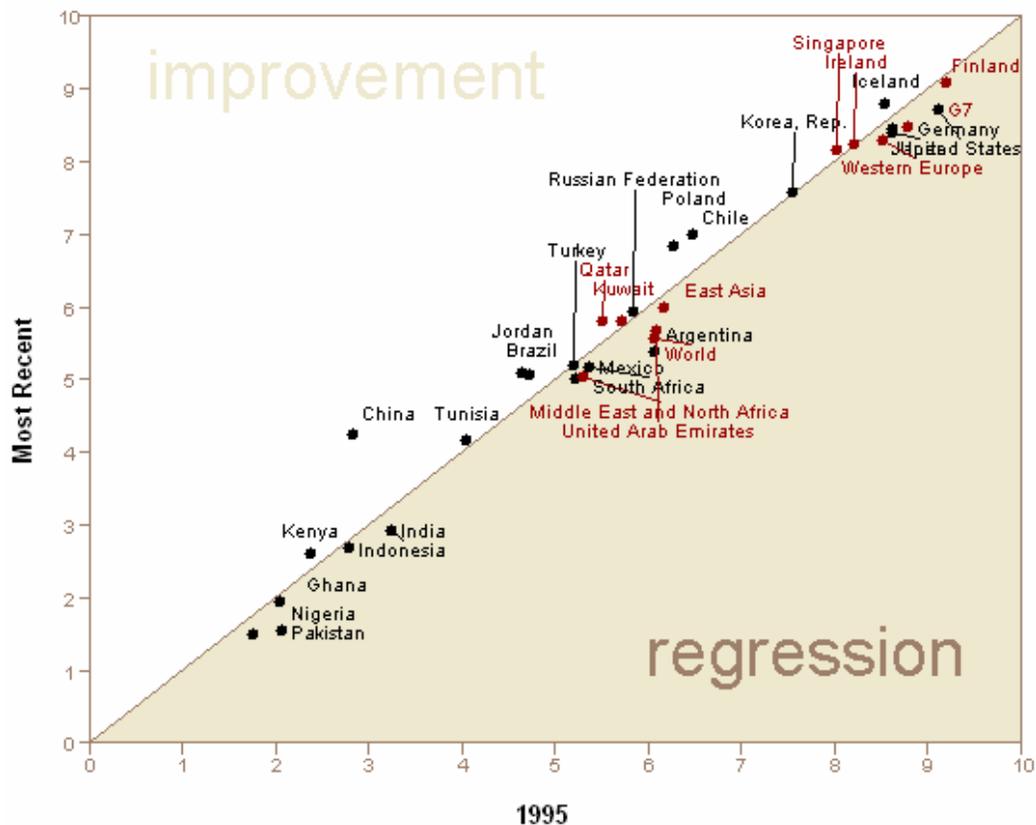
The key message coming out of this quick overview of Qatar's economic prospects is that the timing is right for Qatar's decision-makers to develop a more diversified knowledge-based economy over the middle- and long term less dependent on energy resources and imported knowledge and skills. As we shall explore in the knowledge economy

assessment laid out in the coming chapters, there are however several issues that would need to be addressed in order for Qatar to turn into a competitive knowledge-based economy.

2. Qatar's overall knowledge economy readiness

The Knowledge Assessment Methodology (KAM)¹ is a tool that helps to benchmark a country's position relative to others in the global knowledge economy. The benchmarking exercise offered here compares Qatar with the Middle East and North African Region (MENA), similar countries and competitors as Kuwait, Saudi Arabia and United Arab Emirates, as well as small economies (Finland, Ireland and Singapore) that to a high extent have successfully made the transition to knowledge-based economies.

Figure 2.1: The Knowledge Economy Index for Selected Countries, 1995 and Most Recent Year²



Source: KAM December 2006

The KAM Knowledge Economy Index (KEI) is an aggregate index that represents the overall level of development of a country or region in the Knowledge Economy. It summarizes performance over the four knowledge economy pillars and is constructed as the simple average of the normalized values of 12 selected key knowledge indicators.

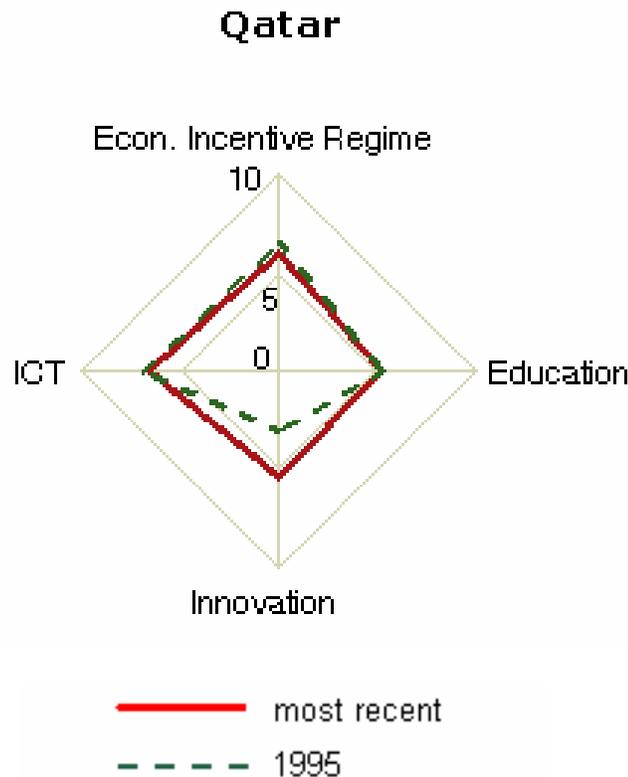
¹ Further detailed of the Knowledge Assessment Methodology is presented in the attached Technical Appendix.

² The most recent year is in most cases either 2004 or 2005.

Figure 2.1 shows Qatar’s performance in the KEI, relative to other countries. The horizontal axis plots countries’ and regions’ performance in the KEI in 1995, while the vertical axis plots countries’ and regions’ performance in the KEI for the most recent year, currently 2004/5. The diagonal line represents the locus of points where the KEI values in 1995 and in the most recent year are equal. As such, countries and regions that appear above the diagonal line have made an improvement in the KEI since 1995, and countries that appear below diagonal line have experienced deterioration in terms of the KEI.

Qatar’s KEI for the most recent year is 5.83 and it ranks higher than the average for MENA as well as the World average (5.59). Qatar’s KEI has improved since 1995 from 5.52 and is now slightly higher than the KEI for Kuwait and UAE but significantly lower than the KEI for Finland, Ireland, and Singapore.

Figure 2.2: The KEI of the four pillars of the knowledge economy in Qatar



Source: KAM December 2006

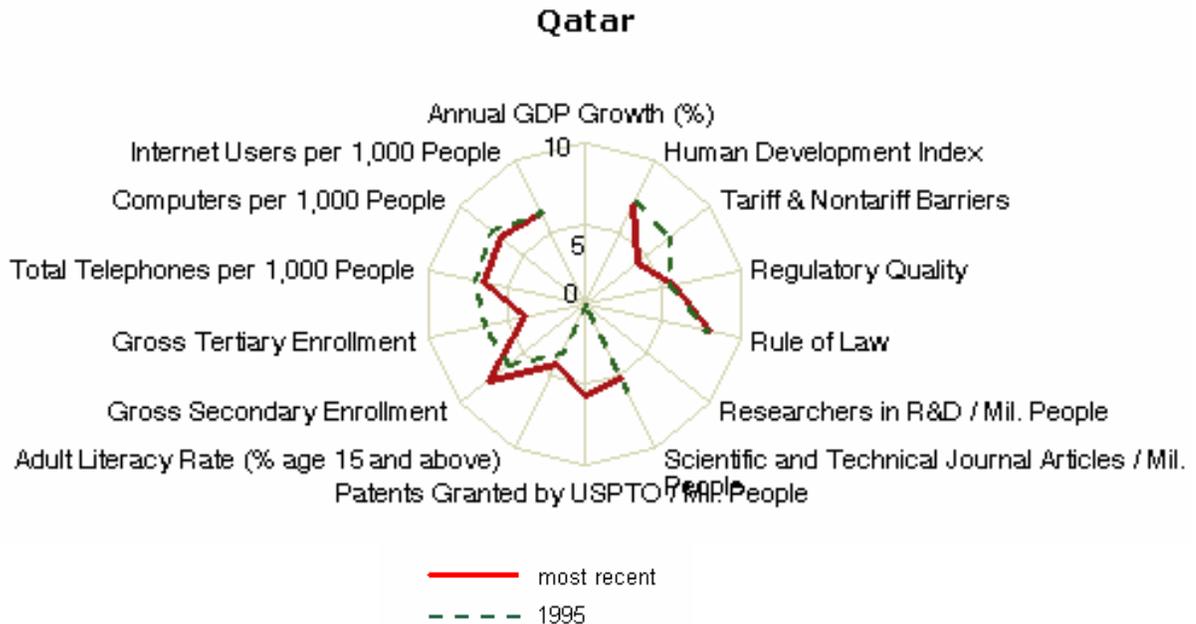
By using the KAM, it is also possible to see how Qatar has performed on the four individual pillars of the knowledge economy. As can be seen from Figure 2.2, there has been a significant improvement in the KEI of the innovation pillar. This does however hardly signify a real progress as the explication is that Qatar did not have any patents granted by the US Patents and Trademark Office (USPTO) in 1995 and had one granted in 2004. This implied that the KEI for this particular "component" of the innovation pillar

jumped from 0, 00 in 1995 to 5,76 in the most recent year as can be seen in the table of Figure 2.3, This significant “jump is explained by the fact that many development countries do not have any patents granted in the United States and therefore score 0 on “patent granted by USPTO”. The KEI of the other component of the innovation pillar measured – the scientific and technical journals articles per million people – actually dropped from 6.11 in 1995 to 5.19 in 2004. There are no data on R&D expenditure in Qatar.

Qatar’s overall development pattern in all four of the knowledge economy pillars therefore does not appear to have changed significantly in terms of the knowledge economy readiness during the past decade.

If we further disaggregate each of the four pillars into three knowledge indicators as in Figure 2.3, we get a more detailed picture of Qatar’s performance in key indicators of the knowledge economy as well as two variables relating to performance: GDP growth and the Human Development Index. This analysis reveals the following key points:

Figure 2.3 Qatar’s knowledge economy scorecard on selected variables, 1995 and most recent year



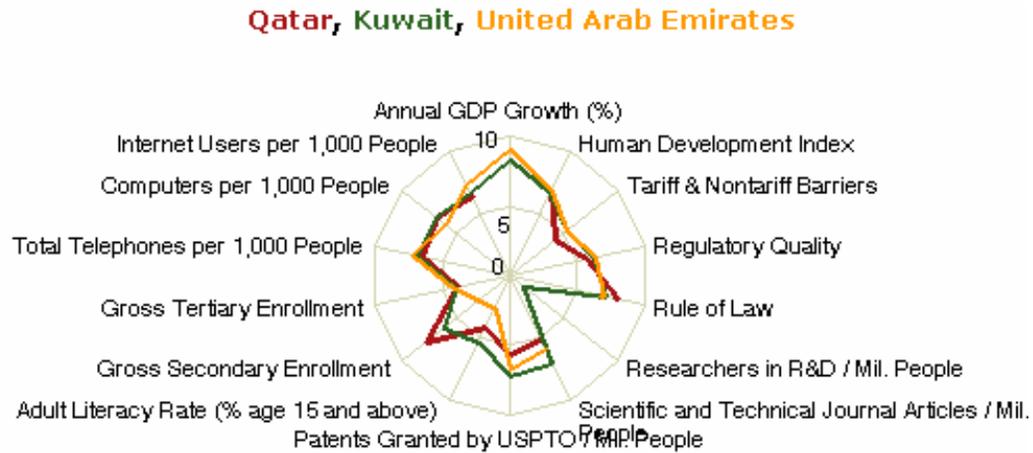
Variable	Qatar (most recent) (Group: All)		Qatar (1995) (Group: All)	
	actual	normalized	actual	normalized
Annual GDP Growth (%)	n/a	n/a	n/a	n/a
Human Development Index	0.849	6.92	0.819	7.28
Tariff & Nontariff Barriers	3.00	4.26	2.50	6.74
Regulatory Quality	0.20	5.76	0.28	5.45
Rule of Law	0.87	8.03	0.91	7.88
Researchers in R&D / Mil. People	n/a	n/a	n/a	n/a
Scientific and Technical Journal Articles / Mil. People	31.67	5.19	48.00	6.11
Patents Granted by USPTO / Mil. People	0.50	5.76	0.00	0.00
Adult Literacy Rate (% age 15 and above)	89.00	4.17	79.20	3.38
Gross Secondary Enrollment	96.80	7.67	79.70	6.12
Gross Tertiary Enrollment	19.10	3.84	27.50	6.48
Total Telephones per 1,000 People	876.80	6.52	268.50	7.05
Computers per 1,000 People	171.20	6.83	57.10	7.48
Internet Users per 1,000 People	212.40	6.44	1.90	6.44

Source: KAM December 2006

- Qatar's *economic and institutional regime* has not changed significantly over the last decade except for the lower score on tariff and non-tariff barriers. The rule of law as well as regulatory quality indicators have improved slightly;
- The KEI for *the innovation system* has improved significant but as already discussed this is not based on real progress but rather the way the KEI is defined and measured for the innovation pillar;
- In *education*, Qatar has improved on adult literacy rate and gross secondary enrollment but scores significantly lower on gross tertiary enrollment;
- Concerning *information infrastructure*, Qatar has improved less than other countries in the world in terms of total telephones per 1,000 people and computers per 1,000 people whereas Internet Users per 1,000 people is at the same level. However, Qatar remains a relatively high-scorer on the information infrastructure pillar.

As shown in Figure 2.4, it is characteristic that the basic knowledge economy scorecard for Qatar for is quite similar to that of Kuwait and UAE, which indicates that these three countries are about the same level in terms of readiness for the knowledge economy.

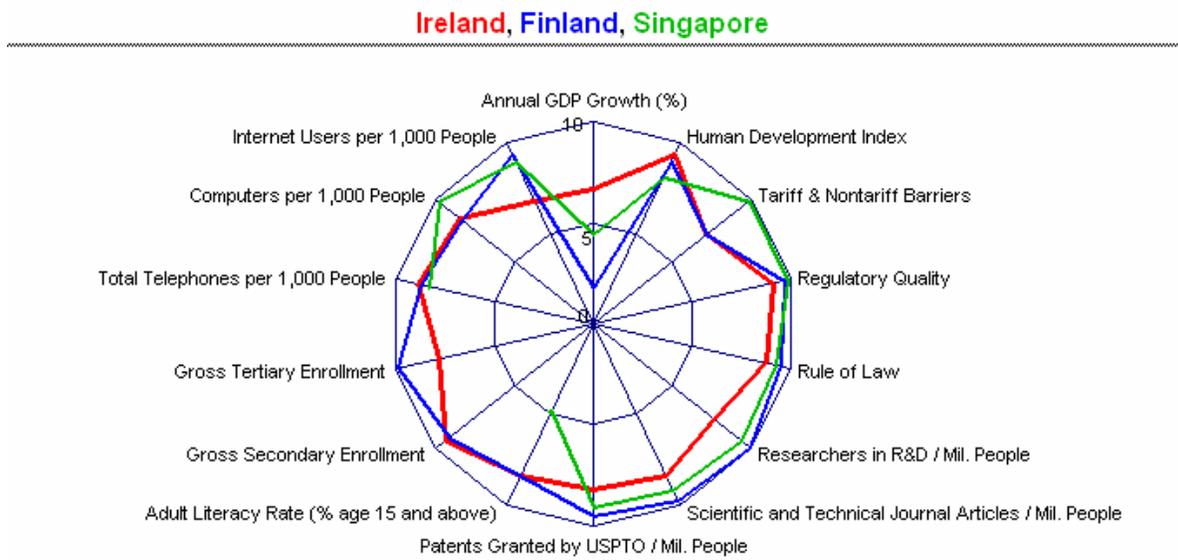
Figure 2.4: Qatar, Kuwait and United Arab Emirates knowledge economy scoreboard on selected variables most recent year



Source: KAM December 2006

Likewise the profiles for the knowledge economy scoreboards for Finland, Ireland and Singapore are quite similar (Figure 2.5). The three countries are doing well on all indicators in the four pillars. The one indicator where these countries are doing less well is the annual growth in GDP, although they are also on this account performing better than most other countries at a similar level of GDP per head.

Figure 2.5: Ireland, Finland and Singapore knowledge economy scoreboard on selected variables most recent year



Source: KAM December 2006

Global competitiveness benchmarking

The World Economic Forum has developed a Global Competitiveness Index (Global CI), which is useful when looking at a country's overall performance in terms of growth and competitiveness. The Global CI separates countries into three specific stages of development and transition, adding degrees of complexity at each stage, called *factor-driven*, *efficiency-driven* and *innovation-driven* (World Economic Forum, 2005).

In the first *factor-driven* stage, countries compete on low prices. They sell commodities or simple products, taking advantage of low-cost labor and/or available natural resources. At this stage of development, the basic ingredients of competitiveness include (1) strong public and private institutions, (2) adequate infrastructure, (3) healthy macroeconomic environment, and (4) a healthy workforce with good basic qualifications. It is more important for countries at the *efficiency-driven* stage to develop more efficient production practices. Product quality rather than low prices or natural resources drives competitiveness at this stage. Quality higher education and training to prepare the workforce for more advanced production (5), good labor and financial markets that operate at increasing levels of efficiency (6), as well as access to and use of the latest technologies (7) are the key indicators of promoting efficient production practices. In the *innovation-driven* stage, countries can no longer only compete on being efficient. Countries must only compete by having (8) sophisticated businesses and through (9) innovation.

Countries that are highly ranked, especially in the innovation sub-index can be assumed to have a relative high readiness for the knowledge economy while good rankings in both the factor-driven and efficiency-driven indicators are strong conditions for moving towards a knowledge-based economy.

As can be seen from Table 2.1, Qatar ranks 46 out of 117 countries in the Global Competitiveness Index. Qatar scores relatively well - rank 27 - on the indicators which characterize the factor-driven stage, but less well on the efficiency of production practices (rank 45) and especially producing new and different products (rank 67). The United States tops the Global CI together with Finland; UAE is ranked as number 32 and Kuwait number 49.

United Arab Emirates, Qatar, and Kuwait have similar Global CI profiles. They do best on the factor-driven indicators, and less well on efficiency-driven indicators and especially on innovation-driven indicators. In contrast, India does relatively well on the innovation-driven indicators given that it has a critical mass in research capacity, well-educated scientists and engineers and a number of well-driven companies that compete at the global level in, for example, information technology services. However, India scores however relatively low on the factor-driven indicators.

Table 2.1 The Global Competitiveness Index 2005 for Selected Countries

	Overall rank	Factor-driven rank	Efficiency-driven rank	Innovation-driven rank
United States	1	18	1	1
Finland	2	2	5	5
Singapore	5	3	2	14
Ireland	21	22	14	19
UAE	32	23	33	42
India	45	65	46	26
Qatar	46	27	45	67
China	48	45	62	48
Kuwait	49	35	44	61

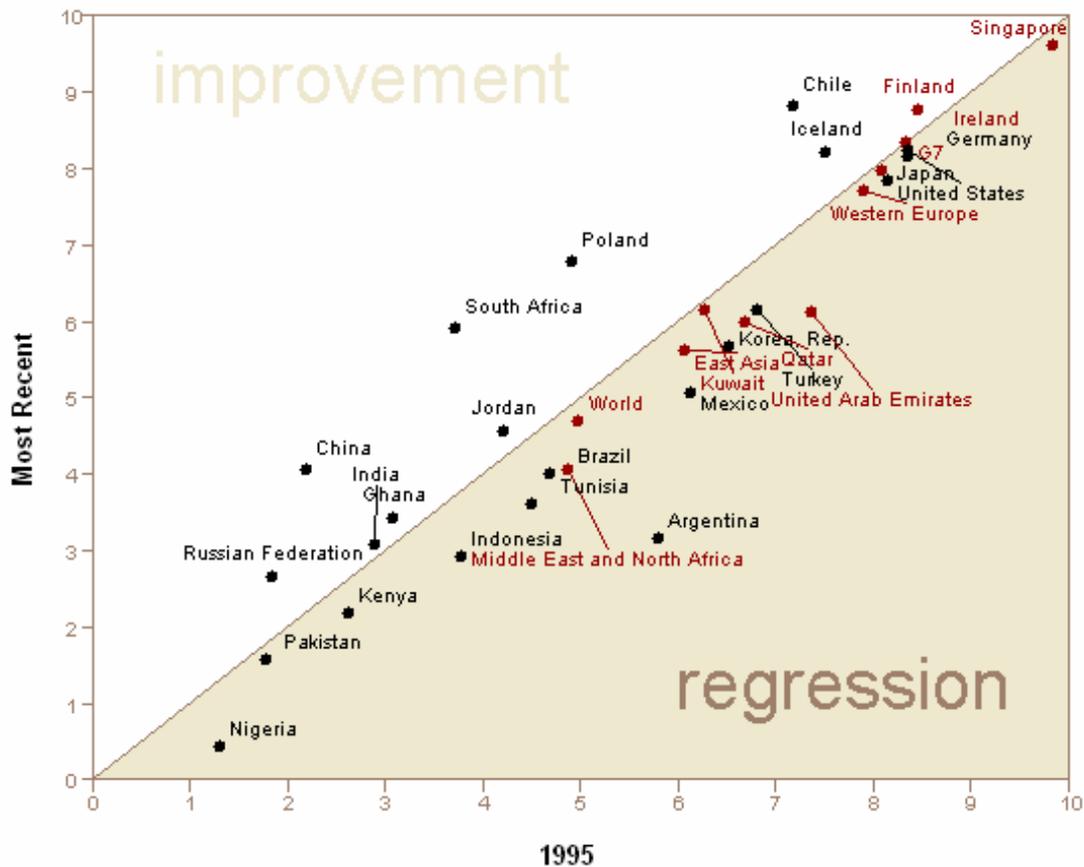
Source: World Economic Forum, 2005

The key message coming out of this short comparison of Qatar’s overall knowledge economy readiness is that Qatar is well prepared for turning its economy into a knowledge-based economy compared to other MENA countries. It is performing relatively well in the economic incentives and institutional pillar and in the information infrastructure pillar but less well in the education pillar (especially tertiary education) and in particular in the innovation pillar. The quality of the Qatari workforce and education system as well as the business sophistication and innovation capacity of its public and private companies will need to improve significantly in order to be able to compete on global markets outside the hydrocarbon sector. An in-depth analysis of the challenges that Qatar faces in strengthening each pillar of the knowledge economy is proposed in the next four chapters.

3. Creating an enabling economic and institutional regime

An adequate economic incentives and institutional framework is a necessary condition to benefit from investments in education, ICT or R&D. Key elements of the economic incentives framework include macroeconomic and political stability, good incentives for doing business for both national and foreign companies, fair competition and regulatory policies that are conducive to entrepreneurship and risk taking. The institutional framework includes the capacity of the government to formulate and implement sound policies effectively; it also includes respect of citizens and the institutions that govern economic and social interactions among them.

Figure 3.1: Performance on the Economic Incentives and Institutional Framework, Selected Countries in 1995 and the Most Recent Year



Source: KAM December 2006

Figure 3.1 illustrates Qatar's performance for the Economic Incentives and Institutional Regime (EIR) for 1995 and the most recent year. The EIR pillar index for Qatar's has decreased to 6.02 in the most recent year from 6.69 in 1995. It ranks well above the average for the MENA region (4.10) and the World (4.73), but is slightly lower than Kuwait and UAE. One reason for Qatar's strong performance in the EIR pillar is because

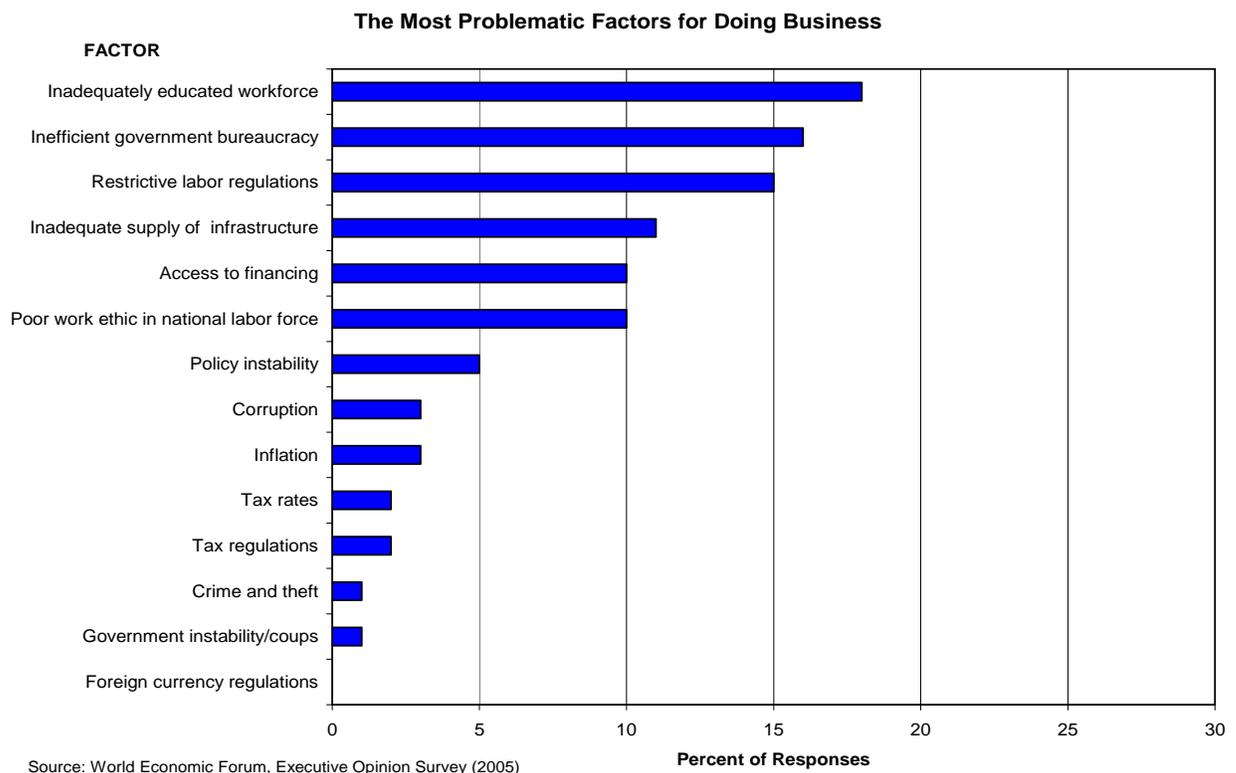
it has done relatively well in terms of “Rule of Law”, which scored a normalized value of 8.03 (see Figure 2.3).

Economic obstacles for doing business

It is important for development towards a knowledge-based economy to have well-established responsive institutions, notably labor market institutions (employment flexibility, focus on employability and training), sophisticated financial markets (e.g. availability of venture capital), well-functioning products and services markets as well as intellectual property rights legislation.

The availability of data for Qatar is to some extent limiting the benchmarking exercise. Qatar was, for example, not included due to its small size in the World Bank/IFC “Doing Business Study” and data on the ease of starting a business, dealing with licenses, getting credit, enforcement of contracts etc. is not available for Qatar. Such a detailed study could be a useful complement to assess the business environment in Qatar.

Figure 3.2 Most Problematic Factors for Doing Business in Qatar



A survey of world competitiveness carried out by the World Economic Form in 2005 does however give indications of problematic factors for doing business in Qatar. As can be seen from Figure 3.2, factors related to the qualifications of the workforce, restrictive

labor regulations, and inefficient government bureaucracy are perceived as the most problematic factors for doing business. Other factors such as corruption, political instability, tax issues, and crime are not considered as problematic issues for doing business in Qatar. Qatar has recently launched a National Labor Market Strategy and Action Plan that seek to tackle the labor market issues. It will be addressed more in detail in the chapter devoted to the education and workforce pillar.

Trade and foreign direct investments

Trade is essential for Qatar in generating the needed technologies, production processes, and capital equipment. Trade contributes to productivity growth by the transfer of foreign technologies that enhance productivity and it can increase competition in ways that stimulate industries to become more efficient. Spurred by WTO provisions, Qatar enacted new laws in 2002 on patents, copyrights and trademarks. Qatar has no competition legislation, nor laws and/or regulations on anti-dumping, subsidies and countervailing measures, and safeguards.

Qatar has recently taken a number of initiatives to increase its economic openness through trade liberalization as mentioned in Table 2 of the Background Report on “The performance of the Qatari economy and its future prospects”. The Heritage Foundation characterizes Qatar’s trade policy as moderately protectionist. Qatar’s average tariff rate in 2004 was 5.2 % up from 4.2 % in 2002.

Qatar played a key role by hosting the 2001 WTO ministerial discussion that launched the so-called Doha Development Round of trade negotiations which aims to lower trade barriers around the world, permitting free trade between countries of varying prosperity.

Sectors such as energy, transport and telecommunication are predominately led by public companies and some of them are sheltered from competition. A recent decision has however been made to open up the telecommunication sector to competition. IctQatar will oversee the liberalization process granting competitive licenses for the provision of network and telecom services.

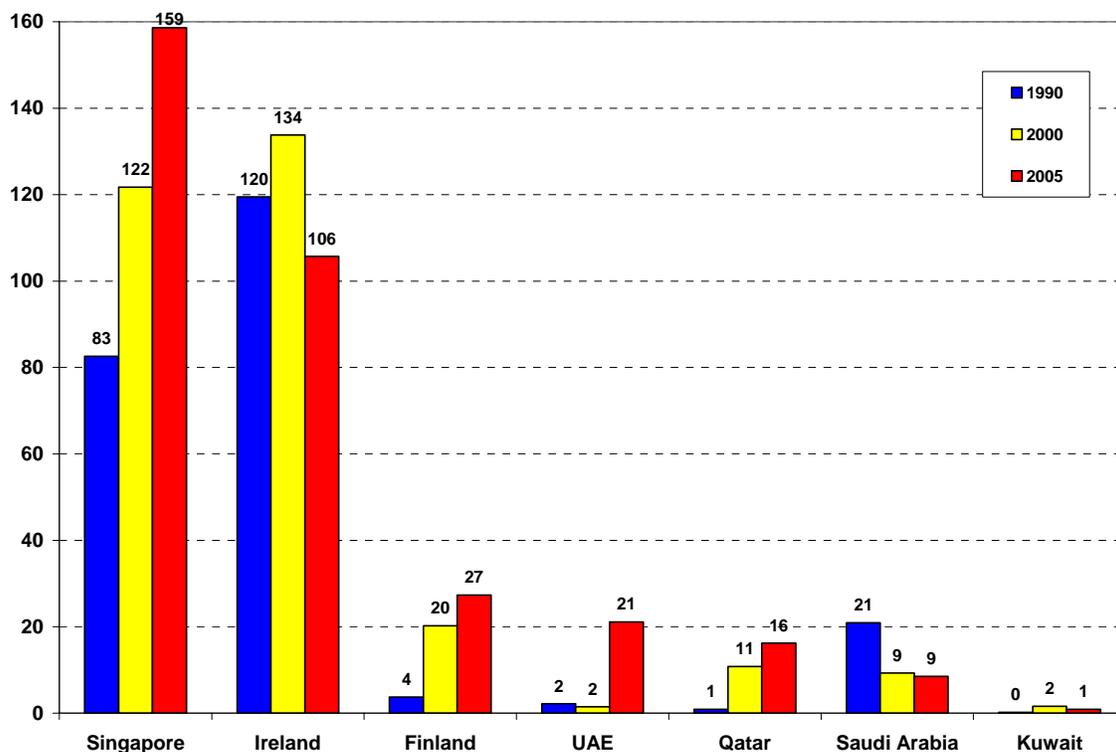
According to the Qatar Government Background Report No. 1, it is recognized that there is a need to increase efficiency and reduce the public sector. The State of Qatar has therefore taken initiatives to increase the role of the private sector in Qatar through the partial privatization of Qatar Telecom; privatization of the port services in 2001, some municipality services in 2005, as well as water and gas projects in 2004. The private sector remains however a relatively small part of the economy. Despite these initiatives, the private sector’s share of the economy is only at about 30 % on average over the period 1999 to 2003.

Qatar’s manufacturing sector (6.7 % of GDP) is based mainly on its comparative advantages in gas-intensive industries. The Government holds a majority stake or is an important shareholder in manufacturing companies such as steel, cement, and fertilizers.

These industries are being promoted partly through investment incentives, including exemption from import duties, and tax holidays for 5 to 10 years.

Qatar has been promoting measures to improve its business and investment climate with the objective of further attracting foreign direct investments (FDI). The measures include establishment of a one-stop window for investment procedures, and the possibilities offered to foreigners by the 2000 Investment Law to fully own companies in selected sectors (i.e. agriculture, industry, tourism, education, health, and natural resources). However, foreign companies remain excluded from investing in certain key activities (e.g. banking, insurance, and commercial representation), and are limited to 49 % in other sectors (WTO, 2005).

Table 3.1 FDI stocks as a percentage of GDP (inward) 1990 - 2005



Source: UNCTAD: World Investment Report 2006

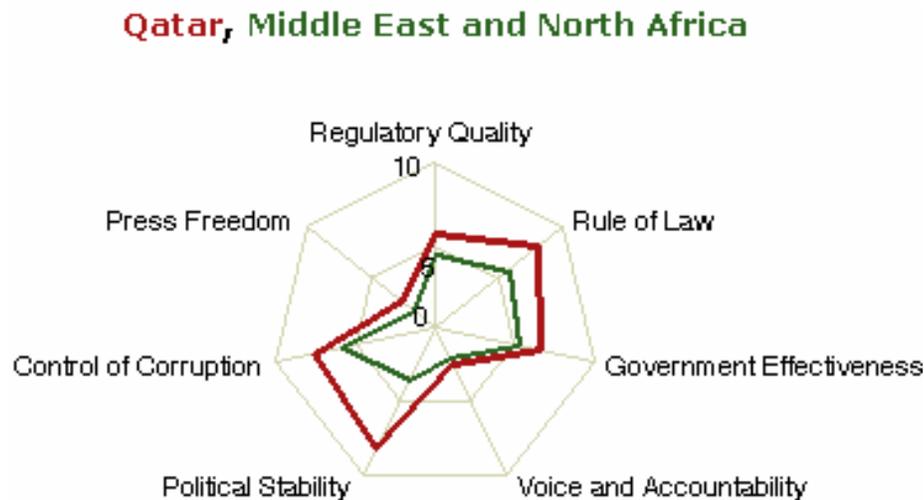
Foreign direct investment inflow remains relatively low in Qatar especially considering its relatively small population (Table 3.1). It has however grown considerably over the last 15 years from 0.9 % of GDP in 1990 to 16.2 % of GDP in 2005. Singapore, Ireland, Finland and UAE have considerable higher FDI inward stocks as a percentage of GDP. Foreign investments in Qatar are mainly concentrated in the hydrocarbon sector, which implies that there is little foreign investment in other sectors of the Qatar economy. This implies that potentially positive spill-over effects from adoption of new knowledge and technology from foreign investments in non-hydrocarbon sectors remain low.

This could be attributed to a number of factors such as the Qatari government tender procedures which give a preferential treatment of 10 % in prices for Qatari contractors and 5 % for Gulf contractors. It may also be due to not allowing foreigners to take share in the privatization of public services. Furthermore, foreign companies pay income tax in the range of 5 to 30 % of their profits compared to the complete exemption of Qatari companies (Qatar Planning Council Background Report No. 1, 2006).

Governance

Governance includes the capacity of the government to formulate and implement sound policies effectively; the process by which governments are selected, monitored, and replaced; and respect of citizens and the state for the institutions that govern economic and social interactions among them (World Bank, 2005). In the World Bank’s database on governance, the following six areas of governance are included: regulatory quality, rule of law, government effectiveness, voice and accountability, political stability and control of corruption.

Figure 3.3 Qatar’s and the MENA region’s performance on selected governance indicators



Source: KAM December 2006

Figure 3.3 shows that Qatar performance is relatively strong on regulatory quality, rule of law, government effectiveness, control of corruption, as well as political stability and relatively weak on press freedom and voice and accountability. On all governance indicators, Qatar is performing better than the average for the MENA region.

Qatar is seeking to improve the productivity of the public sector through the National Project for Administrative Development launched by Decree No. (19) in 2002. The aim is to minimize bureaucratic red tape and increase in administrative transparency that will

help attract increased foreign direct investment and support more robust and sustainable economic development for Qatar. The key elements of the plan are to increase the responsiveness, accountability, efficiency, cost effectiveness and transparency of the public sector through the use of new technologies and professional training.

As mentioned in the Background Report No. 5, there is a “social contract” in the relationship between the Qatar government and its people. The people of Qatar enjoys a high level of private rights related to the education, health, social care and other services such as free or cheap access to water and electricity. However due to the increasing openness of the Qatar economy, the Qatari government has privatized some public services such as the Electricity and Water Company. It has also moved in the direction of applying a health insurance system. The State of Qatar is still keeping what can be called a “social compassion” policy towards its citizen (Qatar Planning Council Background Report No. 5, 2006).

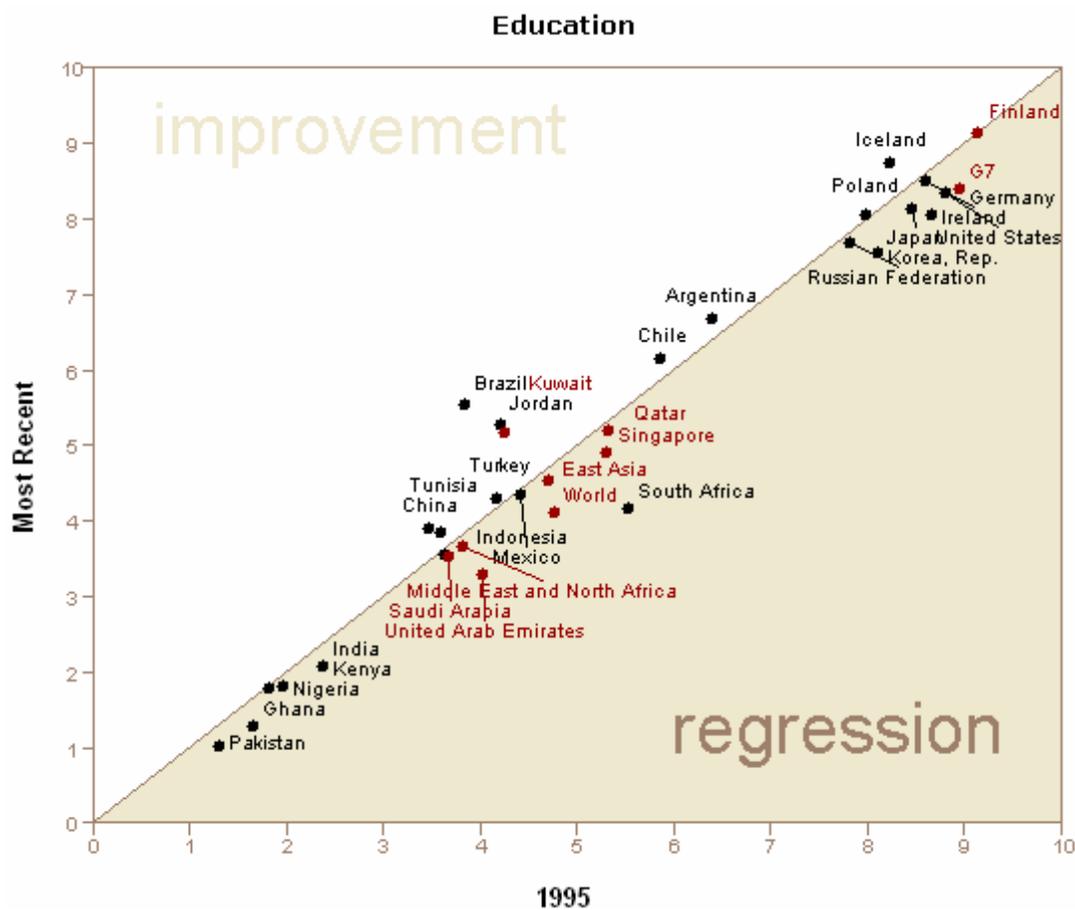
Issues and questions for discussion

- What has been the experience of the “Public service for the 21st Century” Initiative that was launched in 2002? Are there parts of the public sector where performance-based pay has been introduced? What obstacles have been encountered in modernizing and reforming the public administration and services?
- Which business models have been used to reform the public sector? Have public-private partnerships been a significant tool?
- What are the channels of collaboration and information sharing between the public and private sector? What are the mechanisms for consulting with representatives from the private sector on decisions of relevance for the private sector?
- Is there a general trend moving from a “social contract” where the government has the sole responsibility to take care of the citizen towards a system where there is “mutual responsibility”, where the government continues to support the citizen provided that the citizen help themselves?
- Is it envisaged to establish competition legislation and laws and/or regulations on anti-dumping, subsidies and countervailing measures, and safeguards?
- Are there initiatives to set up an organizational and legal framework as well as a time schedule for privatization of some of the public services?
- Are there initiatives to improve the incentives for national and foreign companies to invest in non-hydrocarbon sectors in Qatar?

4. Building a creative education system and a flexible labor market

Education is a fundamental enabler of the knowledge economy. A well-educated workforce is essential for creating, sharing, disseminating, and using knowledge effectively. Improving the quality at every level of the education system from early childhood to adult training is a strong prerequisite for turning Qatar into a knowledge-based economy.

Figure 4.1: Performance on the Education Pillar, Selected Countries, 1995 and Most Recent Year

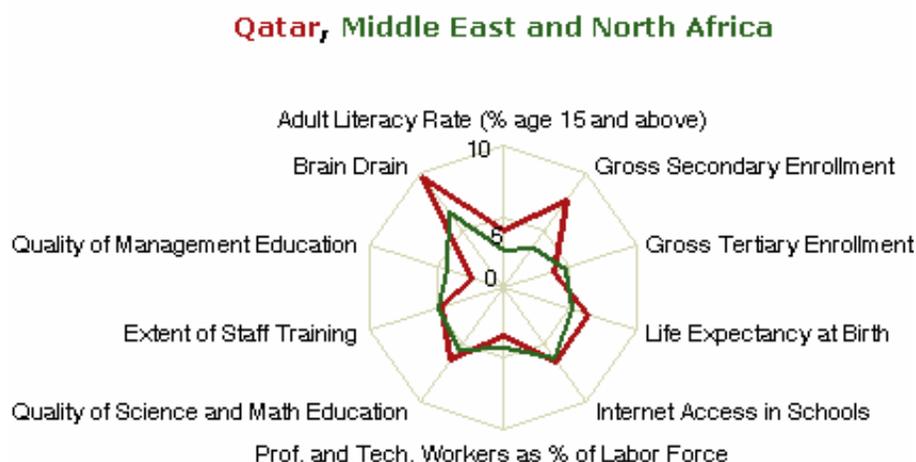


Source: KAM December 2006

Figure 4.1 shows the KEI for the education pillar for 1995 and the most recent year. Qatar's KEI has fallen marginally from 5.33 in 1995 to 5.23 in the most recent year. Qatar ranks well above the average for the MENA region (4.10) and for the World (4.73) but slightly lower than Kuwait and UAE. It ranks above average for MENA (3.68), the World (4.13), as well as East Asia (4.57), but significantly lower than the average for Western Europe (8.16) and especially Finland (9.16).

If we further disaggregate the education pillar into selected education indicators for Qatar and the MENA Region, we get a more detailed picture of Qatar’s education performance.

Figure 4.2 Qatar’s knowledge economy scorecard on selected education variables, 1995 and most recent year



Variable	Qatar (Group: All)		Middle East and North Africa (Group: All)	
	actual	normalized	actual	normalized
Adult Literacy Rate (% age 15 and above), 2004	89.00	4.17	77.61	2.77
Gross Secondary Enrollment, 2004	96.80	7.67	75.65	3.68
Gross Tertiary Enrollment, 2004	19.10	3.84	25.45	4.60
Life Expectancy at Birth, 2004	73.90	6.29	71.71	5.11
Internet Access in Schools (1-7), 2006	4.60	6.49	4.23	6.23
Prof. and Tech. Workers as % of Labor Force, 2004	17.37	3.58	18.66	4.28
Quality of Science and Math Education (1-7), 2006	4.50	6.40	4.27	5.53
Extent of Staff Training (1-7), 2006	3.60	4.65	3.63	4.87
Quality of Management Education (1-7), 2006	3.30	2.37	3.84	4.39
Brain Drain (1-7), 2006	5.80	9.74	3.92	6.67

Source: KAM December 2006

At the global level, Qatar is relatively strong on gross secondary enrollment rate (7.67), and on absence of brain drain (9.74), but relatively weak in gross tertiary education rate (3.84). Relative to the average for the MENA region, Qatar is significantly stronger in the absence of brain drain (MENA 6.67) and gross secondary enrollment rate (MENA 3.68), but relatively weaker in the gross tertiary education rate (MENA 4.39).

The following overview of the major education reform initiatives in Qatar are to a large extent based on material from the Qatar Labor Market Strategy Report that the Qatar

Planning Council has initiated with the help of the World Bank as well as Background Report No. 2.

Major reform initiatives in education

The current plans for national development require the acquisition of sufficient competencies by Qataris to enable them to substitute for non-Qatari workers at the higher end of the skills and occupation ladder. Over the coming years Qatar will spent QR 5.7 billion corresponding to \$US 1.5 billion to improve its education system.

Table 4.1 Strengths and weaknesses of education, training and labor market in Qatar

	Strengths	Weaknesses
Education	<p>Major initiatives under way to improve K-12 (e.g. independent schools)</p> <p>Academic Bridge (if available to all those in need of remedial education –though better to prevent than correct)</p> <p>Development of systematic assessment of competences</p> <p>Education City: offerings from several foreign universities</p>	<ul style="list-style-type: none"> • Lack of clear implementation plan/guidelines • New initiatives seem ad hoc and marginally coordinated with the Ministry of Education • Quality and contents of education at all levels can improve • High dropout and low enrollment rates of Qatari males • Unclear future of public schools and the role of the Ministry of Education • Weak linkages to the labor market (e.g. curriculum and career guidance) • No real support for the disadvantages and those at risk • Few opportunities for lifelong learning
Training	<p>Company-provided training (albeit limited)</p> <p>Selective initiatives (such as the College of the North Atlantic)</p>	<ul style="list-style-type: none"> • Four different vocational credential systems in operation • Yet the system is dominated by weak and uncoordinated public sector training institutions • No linkages with the education system and the labor market • Lack of systematic evaluation and research
Labor market	<p>New labor law</p> <p>Opportunities for qualified Qataris in the short run (internal margin)</p> <p>Relatively unlimited supply of expatriate labor to meet the demand by business and households</p>	<ul style="list-style-type: none"> • No workforce development vision • Lack of administrative capacity and coordination to make proactive use of work permits • Sponsorship rules discourage entrepreneurship among Qataris • Over-reliance of Qataris on public sector employment • Higher unemployment among the young and the less-educated • Qatarization vague and possible unfeasible in its present form • Lack of quality statistics

Source: Government of Qatar, Planning Council. 2005. *Labor Force Market Strategy for the State of Qatar: Main report*.

The Qatar Labor Market Strategy has identified several strengths and weaknesses of the education, training and labor market systems (Table 4.1). Major reform initiatives have been initiated in every sector of the education system in Qatar. There is now a high level of awareness that the education, training and labor market systems will have to improve in Qatar, if the country's strategy of economic diversification is going to succeed.

Table 4.1 identifies several weaknesses in the Qatar education and training systems and even with important new resources going into these systems, significant improvements can only be expected over the longer term. Some key characteristics of the K-12 school systems are that many students do not reach curriculum standards, there are high drop out rates especially for boys, too much focus on rote learning, and the curriculum in most disciplines is outdated.

In 2004, the Supreme Education Council (SEC) was established to spearhead a major reform initiative entitled "Education for a New Era" in primary and secondary education. The main elements of the reforms are the development of Grades 1-12 curriculum standards in four subjects – Arabic, English, mathematics and science; systematic assessment of student achievements; and the establishment of a new school model entitled "independent schools" with managerial autonomy, established curriculum standards in the four subjects mentioned above, possibilities for profits and subject to financial audits.

Table 4.2 Basic data for public schools, private Arab and independent schools in the year 2004/05

	Public Schools	Private Arab Schools	Independent Schools
School Numbers	196	62	19
Teacher Numbers	7996	1259	925
Student Numbers	68163	12627	9145
Arabic Scores Grade 12	534	507	575
English Scores Grade 12	529	539	572
Mathematics Scores Grade 12	653	685	737
Science	638	679	698
Students per Computer	28.7	51.7	5.7

Source: Qatar Government, Supreme Education Council, 2006

As Table 4.2 illustrates, the public schools by far outnumber the private Arab schools and the newly established independent schools in 2004/05. The students in independent schools scored on average significantly better in Arabic, English, mathematics and science than students in public schools and private Arab schools and they had significantly better access to computers. The statistical overview of schools and schooling 2004-05 in Qatar also illustrates that independent schools had higher levels of teacher

expectation of student performance; higher levels of group work; less focus on recitation; higher levels of student motivation; and higher levels of parents' involvement than is the case in public schools and private Arab schools. It would be important to explore whether the better average scores of students in independent schools can be explained by the factors mentioned above and/or that students from independent schools are coming from more advantageous socio-economic backgrounds.

Tertiary education

The University of Qatar had about 10,000 students in 2004-2005. It has six colleges: College of Education; College of Arts and Sciences; College of Sharia and Islamic Studies; College of Engineering, College of Law, and College of Business and Economics. The university offers bachelor degrees in each field and some master's degrees. About 73 percent of the students are women and about 25 percent from other countries mainly MENA countries.

The Qatar University has weak links with the labor market and has developed quite independently of the labor market needs of an economy where the development of the oil and gas sector was paramount. Only 26 Qatari engineer bachelors graduated from Qatar University in the academic year 2003/2004. The result was better in economics and management where there were 287 bachelors graduated in the year 2003/04.

The Qatar University has established a Reform Committee to develop its mission and vision, and to review its organizational objectives, governance structures, and roles. One of the key issues is to re-visit its educational programs to match them with the needs on the Qatari labor market (Background Report No. 2, 2006).

Table 4.3 Foreign branch campuses, student numbers, student tuition fees and program length

	Number of students	Annual Costs	Program length
Virginia Commonwealth	158	\$13,200	4 years
Weil Cornell Medical School	90	\$ 27,000 -30,000	6 years
Texas A&M	87	\$13,972	4 years
Carnegie Mellon	41	\$33,553	4 years
Academic Bridge	218		

Source: Government of Qatar, Planning Council. 2005. *Labor Force Market Strategy for the State of Qatar: Main report* and Background Report No. 2.

The Education City is a project of the Qatar Foundation, which aims “to establish partnerships with elite universities in order to make the Education City an international leader in progressive education and cutting-edge research and train the region's next

generation of leaders and innovators, who will transform Qatar into a knowledge-based society”.

To date, four US universities have established branch campuses in Qatar and Georgetown University is currently establishing a campus of political science as well. The aim is to provide a series of professional degree programs and form closer ties between tertiary education institutions and the labor market, especially in petroleum engineering, business administration, and health.

As illustrated in Table 4.3, few students have so far enrolled in the foreign branch campuses and it is unclear how many students will graduate from these programs as the persistence rate is low. Over the longer term the establishment of the Academic Bridge Program might improve the persistence rate as its mission is to provide top graduates of high schools in Qatar and similar schools elsewhere in the region with the academic and personal skills needed for success in English-language university programs of the highest quality, particularly the universities in the Qatar Foundation's Education City. In comparison about 1,000 Qataris studied abroad at foreign universities.

Labor market

As can be seen from Table 4.4, the oil and gas sector is by far the most productive sector in the Qatar economy followed by the financial services sector. It is also characteristic that 96 % of all Qataris are employed in the public or mixed public/private sectors. Only 4 % of the Qataris in 2004 were working in the private sector down from 10 % in 1986. This has implied that the percentage of Qatari employees (dependent employment) increased from 93 % in 1986 to 98 % of total Qatari employment in 2004.

Table 4.4 Distribution of GDP, total employment, Qatari employment and relative productivity by main sector, 2004. Productivity of government services = 100

Sector	GDP	Total Employment	Qatari employment	Relative productivity
Oil and Gas	62	4	8	2631
Financial services	7	4	8	308
Government services	10	17	68	100
Others	11	21	20	104
<i>Subtotal</i>	90	46	98	342
Trade/Tourism	3	15	2	64
Building/construction	6	27	1	30
Domestic	1	12	0	11
<i>Subtotal</i>	10	54	3	35

Source: Government of Qatar, Planning Council. 2005. *Labor Force Market Strategy for the State of Qatar: Main report.*

The combination of various benefits for Qataris and more generous working conditions in the broad public sector results in Qataris not working in the private sector. The average

wage for employees (15 years and above) per month in June 2005 was QR 3558 in the private sector, QR 9139 in the public sector, and QR 11152 in the public/private sector (mixed).

The average unemployment rate is very low as a percentage of the total labor force (1.4 %), but unemployment can be a problem for less educated and young graduates who cannot find a job in the public sector.

Competition in the Qatari labor market is low in three dimensions public/private; national/expatriate; and male/female. This poses not only a problem in terms of a rigid labor market in terms of low mobility and ineffective allocation of supply and demand of skills but also for meeting the goal of Qatarization. The Qataris are employed almost exclusively in the broader public sector (all but 2,200 of the more than 50,000), whereas 83 percent of non-Qataris are employed in the private sector. Overall the Qatari/non-Qatari ratio in the labor force is 1 to 8.

If the current employment trends continue, the future large investments will have little primary employment impact on Qataris. These investments are concentrated in sectors where Qataris do not work or are in jobs which they cannot readily compete with expatriate workers. According to calculations done for the Qatar Labor Market Strategy, only about 25,000 jobs in the private sector are acceptable to Qataris.

One of the main conclusions in the Labor Market Strategy Report is that the Qatari education system is not producing enough qualified Qataris partly because much of the output of the education system becomes an input to the education system. Especially men are much less educated than women. Qatari female workers have 14.1 years of education compared to 10.7 years for male workers.

Workforce development

The Background Report No. 3 pages 49-56 mentions several education and training institutions that deliver vocational education as well as education and training programs for adults as part of the job or general education upgrading of competences and skills. Qatar Petroleum has its own work-based well-functioning training program.

There are few links and formal relationships between the training institutions and the needs of the labor market; education and training institutions are highly separated with little coordination; no linkages between training and job career prospects, and most of the training centers lack human and financial resources. In general, there is a lack of an overall strategy for workforce development in Qatar.

Several initiatives are now under consideration as part of the National Labor Market Strategy to improve vocational education as well as post-compulsory training. It is being considered to develop a National Qualification Framework; to better link education with the labor market introducing career guidance and job counseling; to enhance the labor

market relevance of school and tertiary education curricula; and to collect and analyze outcomes in vocational and adult education and training.

Issues and questions for discussion

It would be useful to assess to which extent the many education reform initiatives form a coherent vision and strategy for the continuous improvement and relevance of the education and learning system in Qatar and in terms of:

- whether the governance and management of the education system is efficient in terms of quality improvements and cost effectiveness. A key issue is whether the independent schools gradually will replace the public schools and the future role of the Ministry of Education;
- to what extent do the results of the initiatives to provide better information and statistics on school inputs and performance including the recent participation in international student assessment surveys such as PISA and TIMSS inform possible new reform initiatives in education?
- how to increase the number of Qatari graduates (especially men) with tertiary education degree?
- the effectiveness of the large investments in foreign branch campuses. Will there be enough Qataris and other students from MENA countries qualified and interested in studying at the Education City Campus? Will the cost per student be sustainable?
- the responsiveness of the education system to societal trends such as skill development for the Qatari labor market; to collaborate and partner with parents, civil society and private sector; and to embrace the new opportunities of using ICTs to improve access and quality of learning.

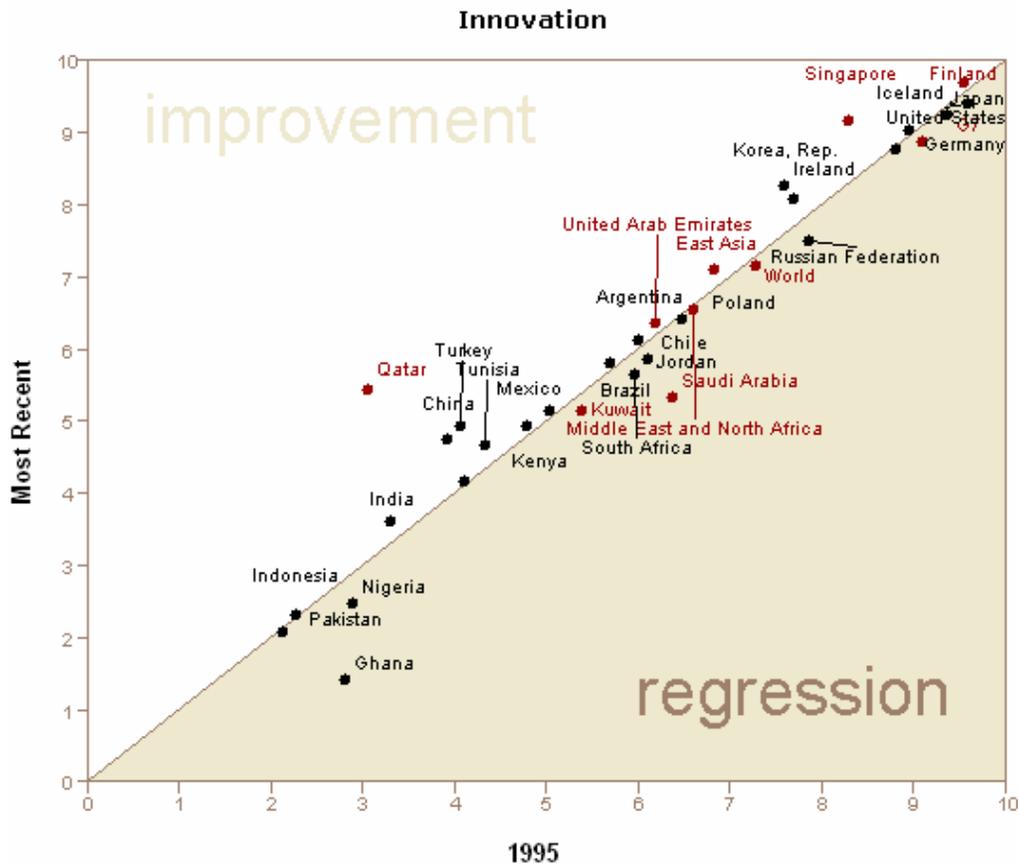
The Qatar Labor Market Strategy is under implementation based on an elaborated labor market and workforce analysis under the auspices of the Qatar Planning Council with the help of the World Bank.

- What progress has been made in the implementation of the recommendations of the National Labor Market Strategy for Qatar in the following nine areas: 1) Improve the labor market information system; 2) Build capacity for labor analysis and manpower planning; 3) Develop a national qualification framework; 4) Understand the male education deficit better and the needs of the disadvantaged and the population at risk; 5) Redefine Qatarization as a flow; 6) Establish a national body for the coordination of workforce development; 7) Improve the system of granting visas to expatriate workers; 8) Move away from a “public sector employment/benefit system”; 9) Develop accompanying regulations to support the new labor law?

5. Shaping a dynamic national innovation system

The innovation system plays an important role in acquiring, adapting, and disseminating knowledge and is therefore crucial for the development of a knowledge-based economy. The actors of the innovation system include private enterprises, universities, research institutes, consulting firms, think-thanks, and others. The innovative performance of a country depends to a large extent on how these actors relate to each other as elements of a broader system e.g. in the form of joint R&D, personnel collaboration, cross-patenting, licensing of technology etc.

Figure 5.1: The Innovation Pillar Index, Selected Countries, 1995 and Most Recent Year

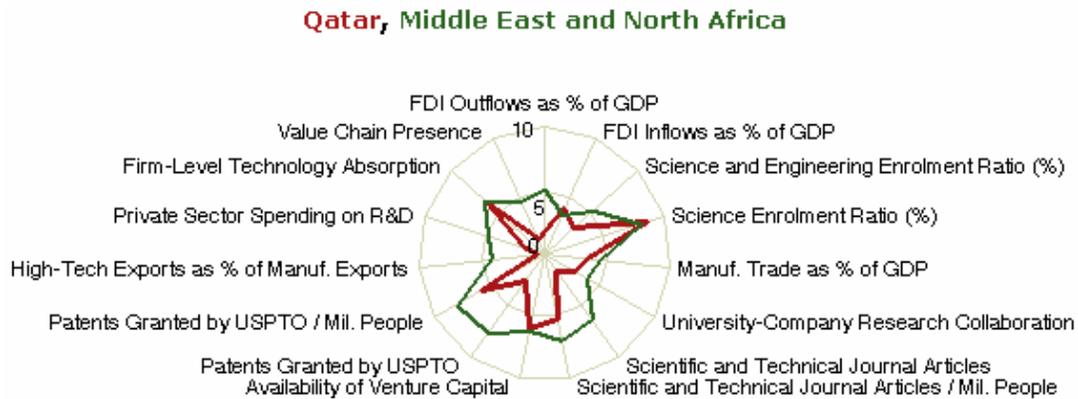


Source: KAM December 2006

Figure 5.1 shows the KAM Innovation Index for 1995 and the most recent year. Qatar's Innovation Index has improved significantly from 3.05 in 1995 to 5.47 in the most recent year. Qatar ranks well below the average for the MENA region (6.57) and the World (7.18) but significantly lower than the average for Western Europe (8.77) and especially Finland (9.71).

There has been a significant improvement in the KEI of the innovation pillar. As already discussed in Chapter 2, this does however not signify any real progress in the innovation performance of Qatar as the explication is that Qatar did not have any patents granted by the US Patents and Trademark Office (USPTO) in 1995 and had one granted in 2004.

Figure 5.2 Qatar’s KAM Scorecard on Selected Innovation Variables, 1995 and Most Recent Year



Variable	Qatar (Group: All)		Middle East and North Africa (Group: All)	
	actual	normalized	actual	normalized
FDI Outflows as % of GDP, 2000-04	0.01	1.84	0.24	5.13
FDI Inflows as % of GDP, 2000-04	2.38	4.02	1.95	3.45
Science and Engineering Enrolment Ratio (%), 2004	19.11	3.14	23.13	5.29
Science Enrolment Ratio (%), 2004	14.46	8.49	13.60	8.10
Manuf. Trade as % of GDP, 2004	27.41	3.55	33.31	4.48
University-Company Research Collaboration (1-7), 2006	2.60	2.89	2.75	3.95
Scientific and Technical Journal Articles, 2003	19.00	1.76	786.29	6.37
Scientific and Technical Journal Articles / Mil. People, 2003	31.67	5.19	92.35	6.91
Availability of Venture Capital (1-7), 2006	3.40	5.96	3.45	6.14
Patents Granted by USPTO, avg 2001-05	0.40	2.65	66.60	7.63
Patents Granted by USPTO / Mil. People, avg 2001-05	0.50	5.76	9.99	8.06
High-Tech Exports as % of Manuf. Exports, 2004	0.70	0.66	4.76	4.22
Private Sector Spending on R&D (1-7), 2006	2.60	1.67	3.03	4.85
Firm-Level Technology Absorption (1-7), 2006	4.90	6.09	5.00	6.45
Value Chain Presence (1-7), 2006	2.60	1.36	3.55	4.61

Source: KAM December 2006

If we further examine selected innovation individual indicators for Qatar and the MENA Region, we get a more detailed picture of Qatar's performance in innovation and technological adoption.

At the global level, Qatar is relatively strong on gross secondary enrollment in science and engineering (8.49) (it has, however, to be taken into account that the total gross enrollment rate in higher education is relatively low and, as mentioned earlier, that Qatar University produces very few engineers), but relatively weak in scientific and technical journal articles per million people, in high-tech exports as a percentage of manufacturing exports, and private sector spending of R&D. Qatar does less well than the MENA region in most of the innovation indicator comparisons in Figure 5.2.

Science and technology initiatives in Qatar

Qatar Science and Technology Park (QSTP) is the main organization promoting innovation and technology initiatives in Qatar. QSTP was established in 2004 with four goals:

- to increase Qatar's capacity to undertake applied research and obtain commercial value from its results;
- adding to the value created by Qatar industry through the development and application of world-leading technologies;
- accelerating wealth creation and economic diversification through the founding of new Qatar-based technology companies;
- creating high-value jobs, in particular for graduates of Qatar's universities.

International companies such as EADS, ExxonMobil, General Electric, Microsoft, Rolls-Royce, Shell and Total have committed more than \$US 100 million of investment in research and commercialization in QSTP over the next 5 years. To date only very few Qatari companies have announced investments in QSTP. One exemption is iHorizons a Qatari software company which is exploring research collaboration with the Carnegie Mellon University branch campus in the Education City. It is intended that the focus of QSTP activities should be related to the economy of Qatar, such as gas and petrochemicals, healthcare, ICTs, water technologies, the environment and aircraft operations. QSTP is a free-trade zone offering several benefits for companies who wish to locale in the park such as the possibility of 100 % foreign ownership, trade without local agent, no taxes, and duty-free import of goods and services.

QSTP has recently established two venture-capital funds. The \$US 30 million New Enterprise Fund and \$US 100 million Technology Venture Fund will respectively invest in early-stage and mid-stage technology enterprises locating in Qatar. The funds provide capital for commercializing technologies developed in Qatar and overseas. QSTP has furthermore announced a new grant program that aims to help researchers to

commercialize their innovations. The Proof of Concept Fund provides grants from \$ 100-500,000 for researchers at universities, in SMEs and government agencies to develop and trial their nascent technologies.

Towards a National Innovation System in Qatar?

A main characteristic of MENA countries in general, and of Qatar in particular, is that few private companies have the incentives, capacity and skills to innovate. One indication of this is that a very small part of the R&D in Arab countries (3 per cent according to UNDP) is funded by the private sector compared to more than 5 per cent in OECD countries. Furthermore the collaboration and communication between private companies, universities, research institutions, and government agencies on science and technology projects are often weak or non-existent.

The focus on innovation and R&D policies for economic development towards a knowledge-based economy is new in Qatar. Background Report No. 3 is very transparent about the low capacity for innovation in Qatar mentioning that a “true national innovation system that is founded on reasonable interactions among research, production, education and training does not exist in Qatar”. One exception is that Qatar has a successful history in technology development in the oil and gas sector by tapping into foreign technology and knowledge through collaboration with foreign companies. However, similar external transfer of technology has not taken place at the same scale in other sectors.

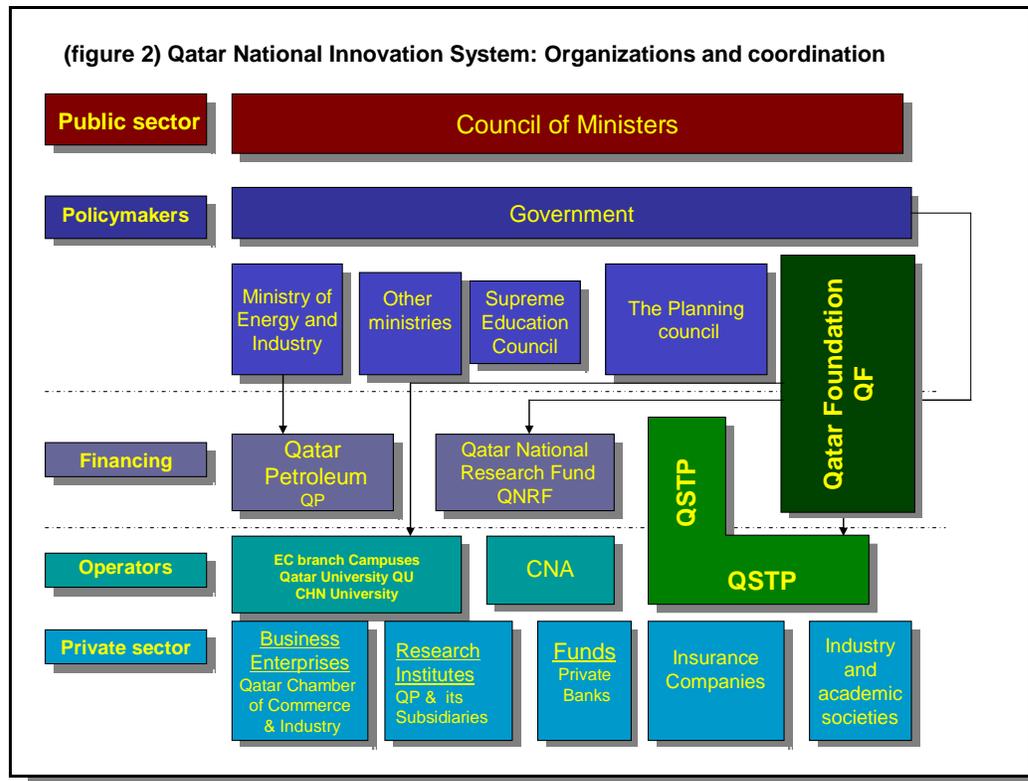
One can distinguish between three major forms of innovation: 1) local improvements based on adoption of technologies that are available worldwide or locally; 2) buildup of competitive activities with some adoption to existing technologies; and 3) design and production of technologies of worldwide significance. The most relevant forms of innovation for Qatar at this stage are clearly the first two mentioned. Qatar’s innovation strategy is primarily based on “importing” human capital and technology through the investments in the Education City and the QSTP.

The investments in the Education City and the QSTP will be a success to the extent they develop indigenous innovation and research capacity through knowledge transfer to the Qatari economy. To fully benefit from foreign know-how and technologies, it is however crucial that Qatar builds up an appropriate technical culture and establish incentives to support and stimulate entrepreneurship. An innovation policy with strong focus on S&T investments without a strong effort on building capacities in science and engineering education and entrepreneurship will most likely not be successful in Qatar.

Figure 5.3 illustrates the current key players in the national innovation system of Qatar. There are however a lack of clear visions and strategies for promoting the national innovation system. As mentioned earlier, the interactions between the key players in the innovation system: government, foreign and national companies in QSTP, branch campuses in Education City, Qatar University as well as other private companies are weak and undeveloped. It is therefore crucial to establish long-term innovation visions

and strategies that systematically seek to strengthen the links and collaborations between the foreign education and research institutions and companies with Qatari education institutions and companies. In order to prepare such visions and strategies, a mapping of existing R&D and innovation activities in terms of input (people, resources) and outputs (scientific articles, new product and processes, patents etc.) at universities, research institutes, and private industries and services would be a useful start.

Figure 5.3 Qatar National Innovation System: Organizations and Coordination



Source: Government of Qatar, Qatar Foundation. 2006. *Innovation in Qatar: Qatar National Innovation System*. Background Paper No. 3.

Cluster development

One way to strengthen the innovation capacity of companies and institutions in Qatar would be to facilitate the development of clusters of innovation in key sectors of the Qatari economy such as health, education, hydrocarbon, tourism, construction, infrastructure and ICT. An important criterion for development of clusters is that they are driven by demand and in some cases develop spontaneous. The cooperation within a cluster is characterized by close links and working alliances between firms and other actors such as research institutions, consulting firms, etc. to improve their collective competitiveness. Innovative clusters can trigger off several benefits such as improved opportunities for innovation, improved business formation, and enhanced productivity.

Box 5.1 illustrates possible public policies encouraging cluster development. Governments should mainly act as facilitators to promote cluster development within a comprehensive framework.

Box 5.1 Possible Public Policies encouraging Cluster Development

Among the various approaches available, public policy can usefully encourage clusters through:

- **Broker policies** to enable value-enhancing dialogue and collaboration beyond what would be achieved in the absence of such initiatives. These aim to strengthen the framework for dialogue and cooperation among the stakeholders involved in clusters, and should not favor individual players. They should be facilitative and non-interventionist.
- **Demand side policies**, such as public procurement, should seek to increase openness to new ideas and innovative solutions, although this policy instrument should be used with caution.
- **Training policies**, such as vocational training programs, may be targeted at upgrading the skills and competencies that are essential for effective clustering of SMEs
- **Promotion of international linkages**, such as the elimination of trade barriers and strengthening of transport and communication systems, along with the harmonization of market regulations, should be designed with a view to enhancing the interplay between foreign and domestic actors.
- **Framework policies for** macroeconomic stability, well-functioning product markets, factor markets, education system, and governance systems, should have effective and consistent rules for inter-actor transactions.

Moreover, both hard-defined aspects, such as social capital and attitudes, and habits that support trust in transactions should be taken seriously by policymakers.

Source: Adapted from Andersson, Thomas, Sylvia Schwaag Serger, Jens Sörvik, Emily Wise Hansson. 2004 and a presentation by Dr. Elisabeth Waelbrook-Rocha

Issues and questions for discussion

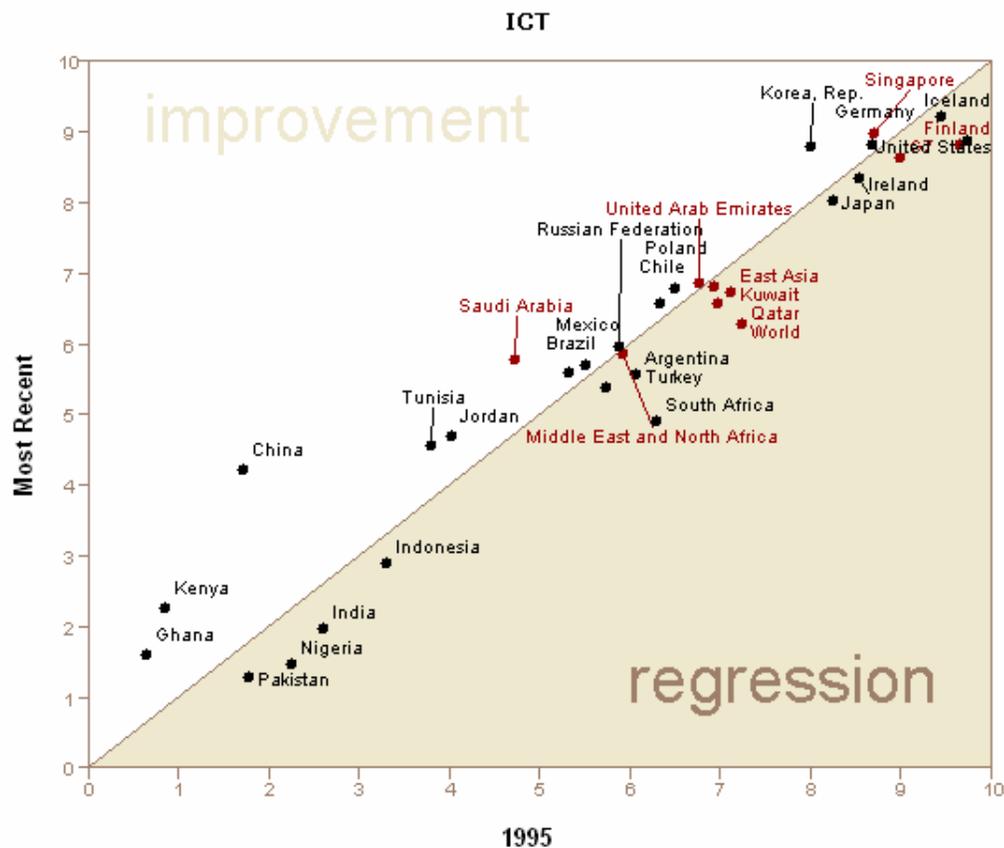
- How could an overall vision with corresponding strategies for promoting innovation policies in Qatar be developed? Which would be the key organizations implementing the visions and strategies?
- It is crucial to establish policies and strategies that systematically seek to strengthen the links and collaboration between the foreign education and research institutions and companies with Qatari education and research institutions and companies. Have such policies and strategies been promoted and if yes how do they work?
- Are there any support mechanisms available to facilitate companies in their adoption and adaptation of new technologies such as technological or innovation service institutes aiming at facilitating innovation in enterprise such as ANVAR in France?
- How could cluster development be facilitated in Qatar e.g. around high priority clusters such as health, education, hydrocarbon, tourism, construction, infrastructure and ICT?

6. Take advantage of an efficient information infrastructure

The use of ICTs can improve the quality and cost-efficiency of existing production and services and create new opportunities in trade, governance, education, business connectivity, healthcare delivery, and environmental and natural resource development. This implies that countries need to harness the full potential of ICT investment in all sectors of their economy. It can also be a powerful tool for reform and higher productivity and competitiveness in all sectors.

The information infrastructure in a country consists of telecommunication networks, strategic information systems, policy and legal frameworks affecting their deployment, as well as skilled human resources needed to develop and use it. To develop a strong information infrastructure, it is necessary to mobilize a variety of stakeholders that are involved in its deployment and use: government, business, individual users, the telecommunication and information service providers etc.

Figure 6.1: The KAM ICT Index, Selected Countries, 1995 and Most Recent Year

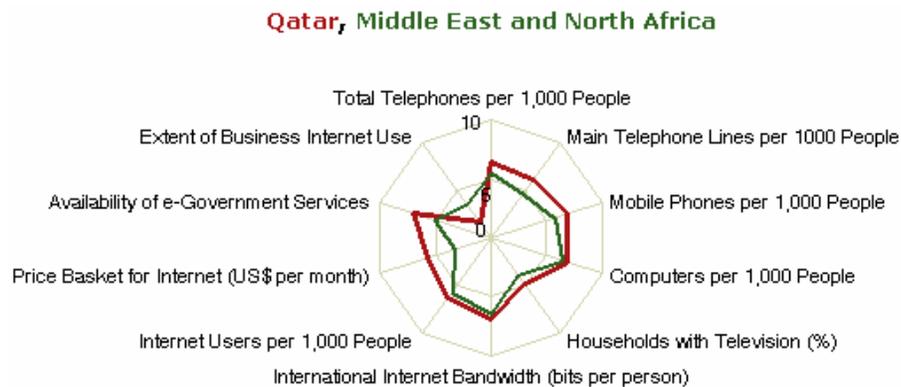


Source: KAM December 2006

Figure 6.1 shows the KAM ICT Index for 1995 and the most recent year. Qatar’s ICT Index fell from 6.99 in 1995 to 6.59 in the most recent year. Qatar ranks above the average for the MENA region (5.89) and the World (6.31) but significantly lower than the average for Western Europe (8.62) and especially Singapore (9.01).

If we further disaggregate the information infrastructure pillar into selected indicators for Qatar and the MENA Region, we get a more detailed picture of Qatar’s performance.

Figure 6.2 Qatar’s Knowledge Economy Scorecard on Selected Innovation Variables, 1995 and Most Recent Year



Variable	Qatar (Group: All)		Middle East and North Africa (Group: All)	
	actual	normalized	actual	normalized
Total Telephones per 1,000 People, 2004	876.80	6.52	556.99	5.63
Main Telephone Lines per 1000 People, 2004	245.70	6.14	162.24	4.72
Mobile Phones per 1,000 People, 2004	631.10	6.89	394.75	5.72
Computers per 1,000 People, 2004	171.20	6.83	131.94	6.31
Households with Television (%), 2004	89.90	4.85	83.87	4.05
International Internet Bandwidth (bits per person), 2004	598.50	6.96	338.36	6.48
Internet Users per 1,000 People, 2004	212.40	6.44	137.31	5.72
Price Basket for Internet (US\$ per month), 2003	22.00	5.68	30.78	3.38
Availability of e-Government Services (1-7), 2006	4.12	7.00	3.43	5.14
Extent of Business Internet Use (1-7), 2006	2.70	1.73	3.23	3.61

Source: KAM December 2006

Qatar’s performance is relatively balanced on the information infrastructure front and is marginally stronger than the MENA region average in almost all indicators. The only exception is the extent of business Internet use, which is very low in Qatar both compared to the World and MENA Region average.

In its annual 'Global Information Technology Report' (GITR), the World Economic Forum has publishes its Networked Readiness Index (NRI) which is defined as the degree of preparedness of a nation to participate in and benefit from ICT developments. Qatar ranked 39th in the NRI while UAE and Kuwait ranked respectively 28th and 46th among 115 countries of the world. Singapore, Finland and Ireland NRI ranking is 2nd, 5th and 20th.

The United Nations Online Network in Public Administration and Finance (UNPAN) publishes the E-government readiness ranking. Qatar ranks 62nd on the E-government readiness in 2005 compared to respectively 42nd and 75th for UAE and Kuwait among 179 countries. UNPAN consider Qatar's e-government one-step electronic services portal a regional best practice that is on par with integrated services portals elsewhere in the world (UNPAN, 2005).

National ICT Strategy

In 2004, Qatar established the Supreme Council of ICT (ictQATAR) with the responsibility to regulate and enable the use of ICTs in Qatar. Its responsibilities include drafting legislation and regulations, defining the ICT vision, developing the ICT strategy and a master plan for Qatar, and managing selected initiatives.

IctQATAR has developed and launched a national ICT plan and strategy, which was presented at the World Summit on the Information Society, November 2005. The National Plan contains twelve ICT development programs: 1) **Infrastructure** includes broadband access for all; 2) **Innovation and capability** includes ICT literacy, fostering ICT research, attracting foreign ICT companies; 3) **Building regulation and legal framework** includes deregulation of the telecom market and e-commerce regulation; 4) **Safety and security** includes Internet security and emergency telecommunication services; 5) **Connected citizens** includes promoting online services and reducing the number of homes with PCs and Internet access; 6) **Connected business** including encouraging SMEs to invest in information systems; 7) **Connected governments** includes online government services and deploy a government-wide Intranet; 8) **e-Education** includes building ICT infrastructure of schools and e-learning initiatives; 9) **e-Health** includes initiatives such as Electronic Health Card and Electronic Patient Network; 10) **e-Finance** includes addressing the security of financial transactions and electronic billing; 11) **e-Tourism and Sports** includes deploying broadband Internet in public places, hotels etc; and 12) **ICT in other economic sectors** includes promoting of ICT in for example the oil and gas sector and adoption of e-procurement to streamline the supply chain.

Until recently, one of the biggest hurdles for ICT development in Qatar was related to the fact that Qatar Telecom was granted a monopoly for telecom services in Qatar until 2013. In November 2006, however, IctQATAR issued new legislation which will put an end to the current telecommunication monopoly by Qatar Telecom. Under the new law,

IctQATAR is charged with promulgating regulations and procedures that will govern the licensing process, market and consumer protection rules, etc.

With the above mentioned twelve initiatives launched by IctQATAR, Qatar is in a better position to reap the benefits from its investments in ICT in terms of increased productivity and quality of existing production and services, as well as creating new opportunities in trade, governance, education, business connectivity, healthcare delivery, and environmental and natural resource development etc.

It is however difficult to assess the implementation of the National ICT Strategy. The National ICT Strategy is very clearly spelled out, but it seems that the actual implementation of the Strategy has not been articulated in terms of specific goals, budget and time frames.

Issues and questions for discussion

- Which elements of the National ICT Strategy and action plan have been implemented so far? What is the budget and time schedule for the Strategy Plan?
- What are the experiences gained with the E-government initiative so far?
- What specific initiatives have been taken to increase the ICT literacy skills of the Qatari population? Are there data on ICT literature skills of the population in Qatar?
- New legislation introducing increased competition in the telecommunication market. In which ways is IctQATAR seeking to ensure that the new legislation will benefit consumers and small businesses?
- Has Qatar developed laws and regulatory frameworks to promote e-commerce activities?
- There has so far been limited success in stimulating Qatari companies to use the Internet to promote their businesses. Are there specific initiatives to stimulate Qatari companies to explore the business opportunities using the Internet?

7. Conclusions

The key message coming out of the assessment of Qatar's readiness for the knowledge economy is that Qatar has plenty of economic resources and opportunities to develop a more diversified knowledge-based economy over the middle- and long term that is less dependent on energy resources and imported knowledge and skills.

It is performing relatively well in the economic incentives and institutional pillar and in the information infrastructure pillar but less well in the education pillar (especially tertiary education) and in particularly the innovation pillar. The quality of the Qatari workforce and education system as well as the business sophistication and innovation capacity of its public and private companies will need to improve significantly in order to be able to compete at the global market outside the hydrocarbon sector.

Qatar is already implementing a number of knowledge-economy measures and projects but many of these projects were initiated without an overall coherent long-term vision developed with inputs from key stakeholders. It is intended that Qatar will develop an ambitious knowledge economy vision to mobilize enthusiasm and common energies across the nation. These visions will be concretized by detailed plans promoting economic incentives and governance frameworks that support a knowledge-based economy and by investments in key pillars for the knowledge-based economy: education and learning, innovation, and information technologies.

This report has identified strengths and weaknesses in each of the four pillars of the knowledge economy. The next task is to define the concrete steps to be taken in order to establish a knowledge economy vision for Qatar, including actionable policies and projects to be implemented.

Qatar will need to take important next steps in order to move towards a knowledge-based economy. A decision is needed on the kind of process that will be followed to take Qatar from intent to create a knowledge-based economy to a strong and clear knowledge economy vision and then to vigorous knowledge economy "execution". Actionable policies, plans, and projects and measures under the pillars have to be fleshed out and implemented.

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Technical Appendix

The Knowledge Assessment Methodology (KAM)

The transition to becoming a knowledge economy requires long-term strategies that focus on developing the four knowledge economy pillars. Initially this means that countries need to understand their strengths and weaknesses, and then act upon them to develop appropriate policies and investments to give direction to their ambitions and mechanisms to enable the policy makers and leaders to monitor progress against the set of goals.

To facilitate this transition process, the World Bank Institute's Knowledge for Development (K4D) Program has developed the Knowledge Assessment Methodology (KAM - www.worldbank.org/wbi/kam), which is an Internet-based tool that provides a basic assessment of countries' and regions' readiness for the knowledge economy. The KAM is a user-friendly interactive diagnostic and benchmarking tool that is designed to help client countries understand their strengths and weaknesses by comparing themselves with neighbors, competitors, or other countries that they may wish to emulate based on the four KE pillars. The KAM is therefore useful for identifying problems and opportunities that a country may face, and where it may need to focus policy attention or future investments, with respect to making the transition to the knowledge economy. The unique strength of the KAM lies in its cross-sectoral approach that allows a holistic view of the wide spectrum of factors relevant to the knowledge economy.

Comparisons in the KAM are made on the basis of 80 structural and qualitative variables that serve as proxies for the four knowledge economy pillars. Currently, there are 128 countries and 9 regional groupings that are available in the KAM. The comparisons are presented in a variety of charts and figures that visibly highlight similarities and differences across countries. The data on which the KAM is based are all published by reputable institutions and the data sources are clearly cited. The data are continuously updated and the country coverage is expanded whenever possible.

Because the 80 variables that are contained in the KAM span over different ranges of values, all variables are normalized from 0 (weakest) to 10 (strongest) and the 128 countries and 9 regions are ranked on an ordinal scale. Details for the KAM normalization procedure can be found on the KAM website.

Given its ease of use, transparency, accessibility over the Internet, the KAM has been widely used by government officials, policy makers, researchers, representatives of civil society, and the private sector. The KAM has also been used by multilateral and bilateral aid agencies, research institutions, consultants and others to undertake preliminary single or multi-country knowledge economy assessments.

Note that, because countries are ranked on an ordinal scale, the KAM illustrates the relative performance of a country as compared to other countries in the KAM database. As such, when a country's performance in a specific variable is indicated to have declined, it could have occurred for two reasons. First, the country's performance in that

variable declined, resulting in lower values in absolute terms. Alternatively, the country's performance could have improved and resulted in large absolute values, but other countries experienced even larger improvements, leading to the country's ordinal ranking falling and resulting in a lower value in relative terms