

TURKEY
KNOWLEDGE ECONOMY ASSESSMENT STUDY

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ABBREVIATIONS

ALL	Adult Literacy and Life skills
CDD	community-driven development
CES	Citizenship and Education Study (of the International Association for Evaluation and Educational Achievement)
CIS	Commonwealth of Independent States
DeSoCo	Defining and Selecting Key Competencies (OECD initiative)
ECA	Europe and Central Asia region
EPO	European Patents Office
EU	European Union
FDI	foreign direct investment
FSU	former Soviet Union
GDP	gross domestic product
GNI	gross national income
GONGO	Government-Organized Nongovernmental Organization
GSM	global system for mobile communications
HEC	Higher Education Council
IALS	International Adult Literacy Study
ICT	information and communication technologies
ILO	International Labour Organization (UN agency)
IMD	International Institute for Management Development
IPO	initial public offering
ISP	Internet service provider
ITU	International Telecommunications Union
KE	knowledge economy
KOSGEB	Small and Medium-Size Industry Development Organization (Turkey)
LTS	Long-Term Strategy
MAM	Marmara Research Center
MOF	Ministry of Finance
MONE	Ministry of National Education
MOT	Ministry of Transport
MSK	Council on Occupational Standards (Turkey)
MYO	higher vocational school (Turkey)
NGO	nongovernmental organization
OECD	Organisation for Economic Co-operation and Development
PA	Privatization Administration
PC	personal computer
PISA	Program of International Student Assessment
POAS	(Turkish petroleum distributor)
PPP	purchasing power parity
R&D	research and development
R&TTE	Radio and Telecommunications Terminal Equipment
S&T	science and technology

SCST	Supreme Council for Science and Technology SIMA
SME	small and medium-size enterprises
SOE	state-owned enterprise
SPO	State Planning Organization (Turkey)
STAP	Short-Term Action Plan
TBV	Turkish Informatics Association
TFP	total factor productivity
TIM	Turkish Exporters Assembly
TIMMS	International Mathematics and Science Study
TTGV	Technology Development Foundation (Turkey)
TUBITAK	Scientific and Technical Research Council of Turkey
TUBITAK-TIDEB	Technology Forecasting and Assessment Directorate
TUSIAD	Turkish Industrialists' and Businessmen's Association
UAF	universal access fund
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
USPTO	United States Patents and Trademarks Office
WBI	World Bank Institute
WDI	World Development Indicators
WEF	World Economic Forum
WTO	World Trade Organization
YOK	Board of Higher Education

**TURKEY:
KNOWLEDGE ECONOMY ASSESSMENT STUDY**

1 EXECUTIVE SUMMARY

1.1 KNOWLEDGE AS A NEW PRODUCTION FACTOR

Products such as computer software, media and entertainment content, new pharmaceuticals, and online commerce and banking services belong to the knowledge economy. Despite great diversity of functions and technologies, their common characteristic is that their production requires a relatively high intellectual input (knowledge) and depends less on the traditional production factors of labor and land. However, there is also an increasing knowledge content in the production and marketing of traditional products such as food, textiles, or tourism.

Countries such as the United States, Finland, and Ireland are widely recognized as leaders successfully transforming to a knowledge economy, dramatically increasing their productivity and global competitiveness, creating new jobs, and, over the longer term, enhancing the well-being of their citizens. This first rank of countries is followed by a second tier of countries, including Turkey, that are competing to reap the benefits of their own knowledge economy. Turkey in particular is at a similar stage of development to the EU accession countries, and furthermore is focused broadly on the same markets and products.

The difference between traditional production factors and knowledge as a production factor is that the latter is a systemic factor, a result of interlinked socioeconomic elements. These elements, which comprise the “four pillars” of a knowledge economy, are as follows:

- the innovation policies, institutions, and incentives necessary for the development and commercialization of domestic and foreign innovations—that is, for the creation of a national innovation system;
- human resource development—specifically, the development of a national education system generating a pool of knowledge specialists and a technology-literate work force;
- information and communication technologies (ICT); and
- a business environment conducive to the development of a knowledge economy.

1.2 GLOBAL LEADERS AND COMPETITORS: LESSONS FOR TURKEY

The experience of those countries that are most advanced in their transformation to a knowledge economy suggests that such an economy for the most part emerges from

within the existing business universe. Most successful knowledge economies have been built on the strength of existing brand names, client base, staff and capital resources. In the context of these findings Turkey is in a relatively strong position to build its knowledge economy. Its international brand recognition is good and there exists within EU markets a positive image of many goods made in Turkey. However, the assessment of Turkish readiness for the knowledge economy shows that much remains to be done. Also, due to the last crisis, Turkey has regressed in some important areas. In particular, the situation relatively worsened in the business environment and preparedness of the educational system to respond to the needs and challenges of the knowledge economy.

The Turkish business universe historically has been dominated by three types of enterprises: state enterprises, which receive preferential treatment and thus have little incentive to innovate; large family firms that have learnt their way around the regulatory system, but which because of the unsupportive business environment are more conservative in their business practices than their managerial and resource potential would indicate; and small, mostly subsistence businesses, often in the informal sector, that have a short-term survival agenda and neither the resources nor the incentive to change.

The challenge for Turkey is to develop a support system for enterprises that will enable them to leverage their entrepreneurial strengths for growth. The country's relatively weak ability to generate new firms and to support creative ones is in part a result of the weak networks linking the different types of firms, including small and medium-size enterprises (SMEs). In successful knowledge economies these networks typically are dense and open, permitting and encouraging a constant flow of goods and services, people, and ideas.

1.3 INNOVATION POLICY FOR THE KNOWLEDGE ECONOMY

Some enterprises (and even sectors) of the Turkish economy hold a prominent position in the European markets. The country's competitiveness has been built primarily on its low labor costs, however, an advantage that inevitably will erode with the rise of competitors from Eastern Europe and Asia. Those industries, such as textiles manufacturing, that are highly labor-intensive will find themselves under increasing threat.

While the number of companies conducting research and development (R&D) rose between 1996 and 2000, the business sector does not make enough investment in this area. The share of the business sector in total R&D expenditure is around 35 percent, compared to the 65 percent OECD average. More than 60 percent of Turkey's R&D effort is undertaken by universities (compared to the 25 percent OECD average), with practically all R&D infrastructure located in Ankara and Istanbul. While the potential of the universities to innovate is strong, university-industry relations furthermore are weak. There is inadequate funding for cooperative projects and research facilities and

equipment are in some cases limited. Attitudes and incentives also are a problem: university professors are mostly encouraged to focus on theoretical work, and there appears to be little awareness among businesses of the scientific and technical capabilities of the universities.

Commercial financing for innovation and R&D is in short supply and venture finance is scarce. Tax incentives also are modest, benefiting only large firms. Much however is expected of the association with the EU Framework Program, which should stimulate the R&D and innovation climate, facilitating the integration of Turkish R&D teams into European networks and providing them with significant support.

There is a clear need to promote new enterprises that can compete on the world market, and that are capable of becoming a significant source of jobs and exports. To strengthen the innovation support services for small and medium-size start-up enterprises and new research ventures, the government should investigate the potential of a financial support mechanism that has a public nature but a private sector orientation. It is essential that any such support be deployed in a truly decentralized way, with the local business and administrative communities taking a significant ownership role.

Measures specifically addressed to SMEs, such as the competitively allocated partial matching financing of contracts made with universities or laboratories, also could encourage the development of the vital relationship of industry with research bodies. The partial public financing of employment contracts signed between enterprise and scientists and engineers similarly could reinforce this relationship. It is of the utmost importance that the counter incentives to such relationships between business and academia be removed.

Foreign direct investment is needed on a much larger scale as a source of new technologies and know-how. It is important that Turkey facilitate the transfer of technology from foreign firms to domestic ones, and in this regard it is important that appropriate technical support be provided to Turkish suppliers of components and materials. Legal assistance also is important, particularly in the areas of technology licensing and acquisition. To take full advantage of FDI, Turkey furthermore should ensure that it is ready to respond quickly to any emerging demand for skilled labor.

There is a need to enlarge the innovation policy constituencies in government, the business community, and local communities. Finland provides perhaps the best model for innovation promotion, operating a Science and Technology Policy Council led by the Prime Minister and including the key ministers for education, finance, labor, and industry, as well as representatives of the main business and labor associations. A similar structure in Turkey could play a key role in directing the national innovation system and hence influencing the overall development of the country.

An audit, to be conducted under the joint auspices of the business sector and the government, should be made of the areas of greatest importance for entrepreneurship and innovation. This could help to identify improvements needed in areas such as

procurement, customs regulations, technical norms and regulations, venture funding, the patents regime, and so forth.

1.4 HUMAN RESOURCES FOR THE KNOWLEDGE ECONOMY

Turkey has one of the lowest relative levels of employment in the world. Agriculture is still an important sector, employing 35–40 percent of the work force, but employment in this sector is falling. Manufacturing employment is rising, but it is not keeping pace with the rise in manufacturing value-added. The service sector is absorbing much of the migrant labor from agriculture, but demand from the other major employer of migrant rural labor, construction, seems set to fall away as Turkey's construction boom appears to be nearing its end. This will limit the employment possibilities for the vulnerable group of unskilled adults with only basic education.

What is particularly worrisome is the fact that unemployment rates among young people generally are higher among those with higher education levels, indicating that education and training is not attuned to the needs of the economy. This has serious implications for productivity and innovativeness of the economy. It also creates dissatisfaction in an important segment of the population and can reduce the incentive to seek education.

Skills and competencies for the knowledge economy are not sufficient to meet current demand, particularly given the rapid pace of technological change. At the secondary school level—and especially among graduates of vocational education, who in theory should be fully prepared for entry to the job market—there is a high level of unemployment, with significant numbers entering retraining programs immediately following graduation. At the tertiary level there is an imbalance between degree programs and short-cycle technical programs. The level of technical expertise is relatively high, especially in science and engineering, but the technical training does not meet industry needs. There is little non-formal training conducted by private enterprises due to the absence of incentives and occupational standards.

If Turkey is to compete in the knowledge economy it must continually upgrade the skills of its work force. Financial and other incentives should be considered to encourage individuals and enterprises to invest in training. These could include tax incentives for individuals and enterprises, targeted incentives to stimulate the development of public and private educational service providers, and special initiatives to promote training by SMEs in both the formal and non-formal sectors.

Turkey urgently needs to address several issues, all of which have direct relevance in ensuring that learning systems provide the skills needed for the knowledge economy. It faces three immediate needs: (a) to pass legislation and complete the implementation of a comprehensive system for defining occupational standards and assessments; (b) to complete the planned reforms of secondary education, and in

particular to refine secondary vocational education, broadening general education programs and moving the more specialized programs to tertiary institutions; and (c) to increase its participation in international assessments, so that it might benchmark its human development capabilities against those of other countries.

Priority should be given to reform of the governance of tertiary education, including universities and Higher Vocational Schools (MYOs), with the objective of increasing the linkages between tertiary education and business. Membership of governing boards should be opened to the business community, the methods by which chief officers are selected must be changed, and program-specific advisory boards must be set in place.

The government also should examine the options and incentives for increasing participation in secondary education, tertiary education, and adult continuing education, as enrollment is low by international standards. The role of public and private financing should be examined, with a view to identifying how enrollment and access can be improved while maintaining equity and affordability for the poor. There also are particular needs to create incentives to stimulate skill development by SMEs, to improve their productivity and support the knowledge economy, and to stimulate the supply by private and public service providers of high-priority training services.

The lack of national and international standards of training are constraining mobility between different levels of the formal education sector, between the formal and non-formal education and training sector, and with institutions outside Turkey. These issues must be resolved if Turkey is to meet the requirements of the EU Barcelona Agreement. The institution of national occupational standards would help address this problem, as would the replacement of university entrance exams by a national secondary school leaving exam. Distance learning programs also should be expanded, and tertiary education quality assurance systems need to be refined in keeping with international norms

1.5 INFORMATION AND COMMUNICATION TECHNOLOGIES FOR THE KNOWLEDGE ECONOMY

The ICT sector is strong in some areas but notably weak in others. In general, weaknesses in the ICT environment are the result mostly of regulatory restrictions that limit supply and raise costs. The usage, diffusion, and production of ICT products in Turkey as a result fall short of their potential.

In terms of readiness for the e-economy, Turkey is ranked 50 of 82 countries by the World Economic Forum. The full and effective implementation of the e-Europe+ program of which Turkey is a member, will advance ICT and enhance the global competitiveness of the sector. Tight interagency coordination of this effort, linked to a comprehensive knowledge economy agenda, is essential.

Foreign direct investment in ICT is of critical importance. Reducing some of the FDI barriers (such as screening and notification procedures, and management and operational restrictions, including restrictions on the employment of foreign nationals) would enable the creation of a more open environment for both FDI and domestic investment, however. If the ICT sector is to deliver to its maximum potential, new entrants should be given the freedom to provide a full range of services and infrastructure.

The cost of access to the Internet in Turkey is among the lowest in the OECD, but while there are a large number of licensed ISPs low Internet charges do not translate into high Internet usage. There are several contributing factors to this paradox of low cost but low penetration, including the lack of investment in infrastructure in general and the Internet in particular; insufficient competition in the provision of electronic communications networks and ICT products and services; insufficient use by the government of e-services; the low quality of local content; and poor computer literacy. To enhance e-commerce and improve the competitiveness of the economy, Turkey must increase Internet penetration among the low-income and regional groups where usage is particularly low.

Turkey has significant ICT production capability, but the worsening global telecommunications climate may threaten this source of exports. The traditional arrangements of the ICT sector are unlikely to prosper in an open, competitive telecommunications market, as is required by the terms of EU membership. The government must reexamine the structure of the ICT production sector as it presses toward a knowledge economy.

The government could stimulate domestic demand for ICT products and services by lifting its restrictions on ICT business, trade, investment, and consumption. Within the context of Turkey's international commitments it should be possible, at least in part, to satisfy domestic demand from domestic supply. In particular, the upgrade of ICT in the educational system could be a significant source of demand.

With the forthcoming liberalization of the market and EU accession Turkey is facing an urgent need to adopt a new, EU-compliant electronic communications regulatory package. New legislation should be enacted as soon as possible to provide the maximum possible impact to the economy of the cost drivers and other benefits of ICT.

1.6 BUSINESS ENVIRONMENT AND THE KNOWLEDGE ECONOMY

For its knowledge economy to thrive, a country must have a business-friendly environment—that is, a proper mix of regulations, implementation practices, incentives, and institutions. A higher level of risk of investment in new products, new markets, and new technologies must be mitigated by more stable and predictable parameters of business making.

Turkey, in contrast to the transition economies (including China), has had a functioning market economy for decades. Many market regulations and institutions have developed and matured over time, and the country has basic administrative capacity to deal with emerging regulatory issues. Deficiencies of the business environment are generated at the deeper level of volatile macroeconomic performance, inefficient governance, and an insufficient emphasis on participatory policymaking.

Macroeconomic volatility has negatively influenced the development of innovative industries by suppressing private and public demand for knowledge-intensive products, crowding out investments in the innovative sectors by directing financing to the public sector, and by failing to put in place the stable parameters necessary for long-term business planning.

Public sector management in Turkey is less efficient in comparison to the OECD average and to many emerging market economies. The distinctions between administration, budgetary entities, and state-owned enterprises (SOEs) are blurred. Employees in SOEs enjoy the status of public servants, with all related protections and rigidities. This has given rise to a culture in which the risk-averse public employee is seen as preferred to the risk-taking private entrepreneur—a perception that is particularly harmful for the young generation of professionals, who after receiving a first-rate education at a Turkish university are neither willing nor able to risk undertaking their own business venture.

The knowledge economy requires the engagement of civil society in the design and implementation of economic policies and regulations, both on the central and local levels. The knowledge economy, epitomized by Internet, simply will not develop without broad public participation, channeled through a functionally organized system that both produces and shares knowledge. The Turkish business community has developed a number of strong associations that have been advocating the interests of their members to the government on a wide range of issues, such as the customs union with the EU. However, the picture is somewhat blurred by the unfinished evolution of the state-sponsored associations of business, academia, and R&D institutions into organizations that truly represent their members and that are capable of being full partners in policymaking. A good start with involving NGOs into design of the e-Transformation Turkey Project should be continued and further strengthened at the level of specific implementation initiatives.

The system of “inflationary economy” that has persisted in Turkey for decades has deteriorated, however, and there is promise of a new paradigm that is more in tune with the challenges of the global economy. A reformed system of institutions and incentives - much more open to competition and innovation - should produce an even playing field and permit less state interference. Many Turkish businesses have proven their ability to compete internationally and now see the old paradigm as a liability.

1.7 IMPLEMENTING THE KNOWLEDGE ECONOMY AGENDA

Activities designed to support the development of the knowledge-based economy should be coordinated and supported under a long-term, comprehensive agenda. This Knowledge Economy Agenda (the Agenda) should have at its core the e-Transformation Program that is being prepared by the government, but it should also embrace the activities of private and private–public stakeholders outside the Program.

The primary objective of the Agenda is to identify and prioritize those activities that have the greatest impact on development of the knowledge economy, taking into account the institutional feasibility of those activities given the resources available. The agenda should contribute to the improvement of the competitiveness of the Turkish economy and enterprises by (a) connecting enterprises with sources of knowledge within Turkey and abroad (that is, creating innovation networks); (b) enhancing human capital to meet the requirements of the knowledge economy; (c) providing infrastructure for an information society; and (d) strengthening the regulatory and economic environment to enable knowledge-based initiatives to develop.

The Agenda must support Turkey’s bid for membership of the European Union and participation in the Lisbon Strategy, the European Research Area, the e-Europe 2005 Action Plan, the Barcelona Agreement on educational standards, and other major European initiatives. More broadly, it should increase Turkey’s ability to cope with competitive pressure and with the market forces existing within the European Union, as defined by the Copenhagen criteria.

The Agenda should support the scaling-up of all activities that have been successful in promoting innovation. This will require a review of the practices of the institutions pursuing these activities to ensure the relevance and efficiency of their programs. The scaling-up of the activities of the Technology Development Foundation (TTGV), for example, could entail a decentralized expansion of its technology development financing program, venture capital funds, technology support services, start-up capital funds, and innovation centers. This could be achieved by way of “franchising” experience of TTGV and other successful organizations to decentralized networks of private and public–private providers.

The Agenda also should support the diffusion of the best experience of university–industry research centers in responding to specific business needs, following the approach, for example, of those centers currently operating in support of the ceramics, textiles, and other sectors. These new centers could follow the existing model, with partial subsidy from TUBITAK, and could be established on the premises of universities that have strong competences in related fields. Biotechnology-related industries such as health and agriculture, and ICT industries in particular could benefit from the development of such research structures.

Market-based mechanisms should be used to stimulate demand for and the supply of knowledge economy skills, but these should be supported by public–private initiatives wherever necessary and wherever positive international experience exists. On the demand side this would entail creating incentives for citizens, especially young people who are already working in SMEs or are unemployed, to learn knowledge economy skills and to apply these skills in the job market or by starting up their own enterprises. On the supply side, incentives should be created to encourage suppliers (especially private sector suppliers, but also public sector training service providers such as universities, post-secondary technician training colleges, and NGOs) to develop flexible, modular, competency-based training content. A skills development grant program, financing tuition fees and perhaps stipends, could be introduced to assist citizens through the necessary skills training courses.

The development of the information society is constrained by the limited access of citizens and enterprises to information infrastructure and to ICT products and services. To help resolve this problem a Universal Access Fund (UAF) could be used in accordance with the electronic communications regulatory package of the EU, the draft law on electronic communications currently under consultation in Turkey, and the objectives of the e-Europe 2005 Action Plan. Allocated on a competitive tender basis, this fund could be used to encourage private investment in the provision of ICT access in targeted regions or locations.

It is essential that the different institutions and partners that have a vested interest in the knowledge economy work together to implement the activities of the Agenda. The experience of other countries indicates that high-level government officials must be involved, as well as all key interest groups—the business community, research and education community, trade unions, and others. The Agenda is also likely to have a regional dimension, requiring therefore the involvement of regional and local authorities, institutions and enterprises, and NGOs in the design, preparation, and implementation of activities in the communities.

2 KNOWLEDGE AS A PRODUCTION FACTOR

Products of the knowledge economy include computer software, media and entertainment content, new pharmaceuticals, and online commerce and banking services. Their common connection is that their production requires a relatively high intellectual input (knowledge) and depends less on the traditional production factors of labor and land. There is also an increasing knowledge content in the production, marketing, and consumption of traditional products such as food or textiles, however. Countries such as the United States, Finland, and Ireland are widely recognized as having successfully transformed to a knowledge economy, dramatically increasing their productivity and global competitiveness, creating new jobs, and, over the longer term, enhancing the well-being of their citizens. This first rank of countries is followed by a second tier of countries, including Turkey, that are competing to evolve their own knowledge economy. Turkey in particular is at a similar stage of development to the EU accession countries, and furthermore is focused broadly on the same markets and products.

The difference between traditional production factors and knowledge as a production factor is that the latter is a systemic factor, a result of interlinked socioeconomic developments. These elements, which comprise the “four pillars” of a knowledge economy, are as follows:

- the innovation policies, institutions, and incentives necessary for the development and commercialization of domestic and foreign innovations—that is, for the creation of a national innovation system;
- human resource development—specifically, the development of a national education system generating a pool of knowledge specialists and a technology-literate work force;
- information and communication technologies (ICT); and
- a business environment conducive to the development of a knowledge economy.

The main difference between a knowledge-based economy and a traditional economy is in the way in which knowledge is generated and introduced into the production process. In traditional economies the knowledge component (innovation) typically takes the form of ad hoc, exogenous ideas (such as the inventions of Thomas Edison, for example); in a knowledge economy the knowledge is created and used as an integral part of the process of designing and implementing new business activities and products. This systemic use of knowledge as a production factor gives rise to products the value of which is less and less embedded in their physical components, and more and more in the knowledge component.

There is a close relationship (but not necessarily an identity) between successful individual knowledge-intensive enterprises and a knowledge economy. It would not be possible to have a knowledge economy without a critical mass of knowledge-intensive enterprises, but at the same time an economy that has knowledge-intensive enterprises but which lacks an adequate business environment, an educated population, a national innovation system, and modern ICT infrastructure would be exposed to the risk of losing its leading position to competitors. In the knowledge economy individual enterprises are exposed to even harsher competition than that which they face in a traditional economy. Knowledge-intensive enterprises enjoy a temporary “monopoly of knowledge” and generate relatively higher profits, but this knowledge monopoly usually is short-lived and difficult to sustain because the knowledge component typically can be replicated without the need for extensive and costly research and development (R&D). Intellectual property rights are not always adequately protected; they furthermore are by nature controversial and typically are short-lived.¹ A knowledge economy not only has to continuously improve its products but also must continuously diversify. Finland, for example, is under great pressure to diversify from its excessive reliance on Nokia.

This study is organized as follows. Section 3 looks at the lessons learned from the leaders in the knowledge economy, and assesses Turkey’s potential competitors. Section 4 examines the conditions, policies, and institutions that make possible the innovation process (that is, the process from idea to commercialization). Sections 5 and 6 assess the environment in Turkey and the policies that are in place to support improvement in two key areas: human development and ICT. Section 7 assesses Turkey’s business environment and identifies areas in need of reform if the knowledge economy is to thrive. Finally, Section 8 presents suggestions for the next steps that the country should take to meet its knowledge economy agenda. Annex 1 summarizes these policy recommendations and Annex 2 presents comparative statistical data.

¹ The recent political debate around generic HIV/AIDS drugs, and the follow-up compromise between the governments and pharmaceutical companies holding patents for these drugs, provide perhaps the best example of the limited nature of intellectual property rights.

3 GLOBAL LEADERS AND COMPETITORS: LESSONS FOR TURKEY

3.1 KEY SUCCESS FACTORS IN THE KNOWLEDGE ECONOMY

There are clear leaders in the race to a knowledge economy (KE), but no single model has yet emerged to guide transformation in other countries. Different countries have responded to the challenge of transformation in different ways, as informed by their history and culture; their national priorities; their economic status, size, geography, and population; and, last but not least, by the opportunity of the moment. Twenty years ago the United States, Finland, and Ireland were among the least likely candidates to lead transformation to the knowledge economy. In the 1970s and 1980s the United States was losing its competitive and innovative edge to Japan, in the eyes of many analysts as a structural consequence of inefficient corporate governance, declining research capacity, and an outdated model that depended on individual entrepreneurship as a driving force rather than the “corporate engine.” In the early 1990s Finland, which had enjoyed a privileged position serving the vast markets of the Soviet Union, entered deep recession when those markets were opened to global competition. Ireland traditionally served primarily as a source of relatively inexpensive labor for the United Kingdom. Paradoxically, while the United States, Finland, and Ireland have pioneered the development of the knowledge economy Japan, Russia, and the United Kingdom have been less successful with their own KE agenda.

Even a casual comparison of these three top performers shows that they have followed very different models of socioeconomic development. There nonetheless emerge from study of these three cases several policy challenges that are common for any country seeking successful transition to a knowledge economy. These common requirements include primarily:

- An ability to convert the social and political pressures of the *Schumpeterian* destruction of old industries, work places, institutions, and shifting demand into opportunities for new economic activity.
- Recognition of the critical importance of education in preparing society for the challenges posed by the knowledge economy, and as the source of innovations.
- High-level support for a long-term policy agenda supporting innovations. Specifically, the economic environment should be characterized by low costs of business entry and exit, favorable taxation, active promotion of foreign direct investment (FDI) and of the protection of intellectual and other property rights, and low trade barriers.

- Provision of support to private initiatives and to public participation in the modernization of information and communications technology (ICT) infrastructure.
- Government use of ICT and public funding of research and development (R&D).
- Support for a culture of innovation. This culture should be characterized, at least in part, by social acceptance of high rewards for innovators and entrepreneurial risk-takers and by the existence of demand for new products and services.

There are no obvious common characteristics and patterns among countries, including Turkey, that are aspiring to become knowledge economies. Comparison of Turkey with Poland, Mexico, and the Republic of Korea underlines this point.² Progress toward a knowledge economy can be modeled at a basic level in terms of the relationship between an outcome (high-technology exports as a proxy of knowledge-intensive, globally competitive production) and regulations and inputs that are conducive to development of a knowledge economy (see Table 1). In this context Korea represents the most consistent model of the relations between outcomes and inputs and regulations (with the exception of FDI).³ Poland, despite high FDI and despite possessing a high percentage of professional workers, scores poorly for outcomes. Mexico, which has a relatively high level of outcomes, scores poorly in terms of R&D expenditure and flexibility of regulations.

Table 1. KE progress in Turkey, Poland, Mexico, and the Republic of Korea

	Turkey	Poland	Mexico	Korea
Outcomes				
High-technology exports (percentage of manufactured exports, 1999)	4	3	21	32
Inputs				
Professional/technical workers (percentage of the labor force, 2000)	6.1	21.6	13.2	16.7
FDI (percentage of GDP, 1990–99)	0.46	2.39	2.19	0.67
Total expenditure for R&D (percentage of GNI, 1987–97)	0.45	0.77	0.33	2.82
Internet hosts per 10,000 people (2000)	2.87	4.22	3.94	4.62
Regulations				
World ranking of business competitiveness (2003)	52	47	48	23

Source: Various; see Annex 2.

These observations suggest that knowledge cannot be introduced as a production factor in the manner of a “classical” production function, whereby increased input of

² Finding proper comparators is more an art than a science. For general benchmarking, population and the level of economic development are perhaps the most important indicators. In this context, Poland, the Republic of Korea, and Mexico may be the most suitable comparators for Turkey (see Annex II). Specific institutional solutions (best practices) have to be decided on a case-by-case basis.

³ For more information on Korea’s effort advance its knowledge economy agenda, see “Korea and the Knowledge-Based Economy,” World Bank Institute, OECD, 2000

capital and labor is expected to result in increased output. The successful introduction of knowledge to an economy is foremost a social process, articulated and implemented as an interplay between the government, business, academia, nongovernmental organizations (NGOs), and society at large. Transformation to a knowledge economy is driven by multiple and diverse forces of change, manifest in the demand for and the supply of knowledge. This demand for and supply of knowledge may be generated by consumers (households), other businesses, government, civil society, or foreigners (through foreign trade and FDI). The way in which these different sources make up the overall demand and supply varies between countries and over time. A knowledge economy will not be sustainable if introduced from the top alone, by government fiat, nor can it be generated solely by private interest, without the participation of the state as a regulator and consumer of innovative products. A proper mix of private and public supply of and demand for knowledge is key to the success of the transformation.

The experience of the leading countries shows that to build a successful knowledge economy the national innovation system, human development, and ICT and business environment must develop in parallel and interact efficiently. The challenge for government is to identify the interrelations and synergies between these areas, rather than to merely operate separate sectoral policies. Transformation to a knowledge economy is a continuous process requiring a strategic view, adjusted over time to respond to changes in the driving forces, to challenges that emerge from competitors, and to opportunities represented by new technologies. In this process it is important to keep in mind the following questions:

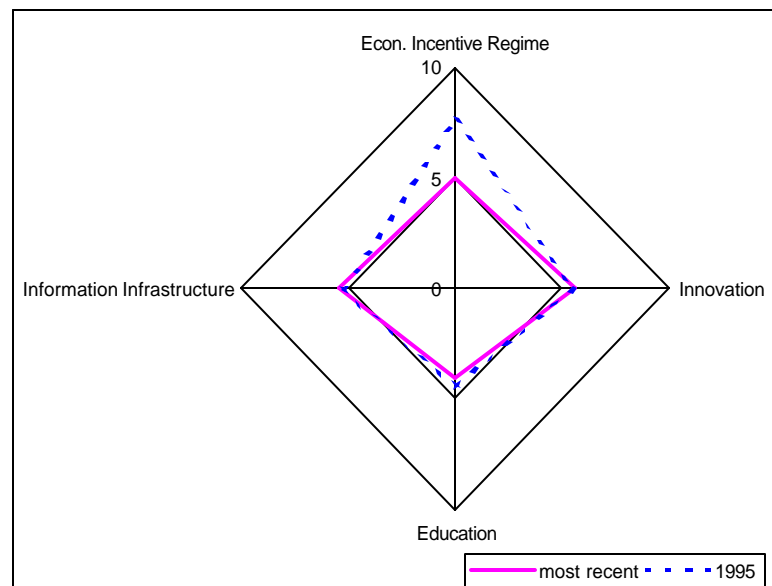
- What are the forces of change impacting the knowledge economy in terms of its economic and institutional framework, human resources development, the information society, and the national innovation system?
- What are driving forces in the demand for and supply of a knowledge economy?
- How do particular events enhance the knowledge economy by:
 - closing digital gaps (in terms, for example, of hardware, software, ICT infrastructure, or computer literacy),
 - closing regional gaps,
 - closing social gaps (for example, by alleviating poverty or enhancing gender equality), and
 - strengthening an open (civil) society (specifically, what mechanisms and institutions)?

In its 2000 Lisbon Strategy, the European Council set out a 10-year plan to make the EU by 2010 the world's most dynamic and competitive knowledge economy. The strategy advises EU member states, among other recommendations, to increase their

R&D expenditures to as much as 3 percent of gross domestic product (GDP). In light of the previous discussion, this target should be treated as an *ex post* monitoring tool rather than as an *ex ante* formula for success. Attainment of the Lisbon goals will not be achieved simply through the administrative allocation of resources to R&D; for while at one level R&D may be considered a driving force for growth, it is at the same time a consequence of deep economic and social changes.⁴

3.2 KEY CHALLENGES FOR TURKEY

Preliminary assessment of Turkish readiness for the knowledge economy, as encapsulated in Table 1, shows that much work remains to be done. The country has in some important areas in fact furthermore regressed: The standardized “diamond” of Turkish readiness to succeed in a knowledge economy has shrunk in the last few years in two important dimensions (see Figure 1).⁵ First, Turkey has in terms of economic incentives suffered large losses relative to its competitors. Second, its preparedness in terms of providing the education required for it to be able to respond to the needs and challenges of the knowledge economy also has declined. This is particularly worrisome because the baseline is at a relatively low level. The country’s agenda for reform in education clearly is inadequate.



⁴ Public R&D expenditure is 79 percent of the EU average; however, business-financed R&D is only 21 percent of the EU average (see Annex II).

⁵ In the WBI methodology the highest level (10) is a level of selected indicators in a given year in the most advanced country. The smaller the diamond for a given country (Turkey), the poorer are its abilities to successfully compete in the knowledge economy (for detailed indicators see Annex II).

Figure 1. Turkey's Preparedness for Transition to a Knowledge Economy (WBI)

In the last decade the Turkish government has undertaken a number of initiatives to meet the challenges of the emerging global knowledge economy. These efforts have not yet come together in a comprehensive KE agenda, but work is underway to resolve this situation.⁶ TUBITAK (the Scientific and Technical Research Council of Turkey, an operational arm of the Supreme Council for Science and Technology (SCST)) under the auspices of the SCST has been preparing a number of long-term technology scenarios for the development of particular sectors of the Turkish economy (Vision 2023). The State Planning Organization additionally has been authorized by the government to design and coordinate the implementation of the e-Transformation Turkey Project. This project will follow a broad agenda that stresses the importance of the transformation of society as a whole, and should therefore avoid the trap of taking a technological approach that is too narrow. The first step of the project is the Short-Term Action Plan (STAP). This will be followed by the Long-Term Strategy (LTS). Both the STAP and LTS will be constructed according to the four-pillar model of a knowledge economy.

3.3 CAPABILITY OF THE BUSINESS SECTOR TO SUPPORT THE KNOWLEDGE ECONOMY

The experience of those countries that are most advanced in their transformation to a knowledge economy suggests that such an economy for the most part emerges from within the existing business universe. Most successful knowledge economies have been built on the strength of existing brand names, client base, staff, and capital resources. In the context of these findings Turkey is in a relatively strong position to transform. Its international brand recognition is good and there exists within EU markets a positive image of goods made in Turkey. These in particular include minibuses, ceramics, white goods, textiles, and tourism.

Turkey's economy has in the last two decades become more competitive and more open to global markets. The customs union with the EU in 1996 strengthened many Turkish businesses, some of which managed, through rationalizing costs and introducing new technologies, to gain a significant market position in EU markets. The evolution of Turkey's trade openness has been exceptionally dynamic. The ratio of foreign trade to GDP has increased about 53 percentage points since 1980, a performance that is close to that of Mexico and the Republic of Korea. Turkey also has narrowed the gap in the level of its openness with the EU, by 2000 attaining a 66 percent openness ratio (compared to the 74 percent ratio for the EU as a whole). This compares well with levels of openness in Latin America (42 percent), but is significantly below that of East Asia (95 percent for the region). The trend toward

⁶ During the 1990s there were five, later abandoned, governmental initiatives to prepare a knowledge economy agenda.

greater openness however is not easily sustainable (see also Section 4). Turkey also is far from fully exploiting the potential of its large domestic markets, its inexpensive labor, location, and the Turkish diaspora, particularly in the countries of western Europe.

The Turkish business universe historically has been dominated by three types of enterprise:

- state enterprises with their roots in the policies of the 1930s;
- large private companies, primarily family-owned and -managed conglomerates; and
- private small businesses, including those in the informal sector.

Compared to other market economies, Turkey has a relatively large number of state-owned enterprises. This can be explained by the mixed-economy model introduced at the beginning of the Turkish Republic. This model still exists but is outdated, with no clear demarcation between administrative agencies and enterprises or between civil servants and employees. Privatization in Turkey has proceeded at a much slower pace than in other emerging economies, with sales consistently falling short of expectations: with the exception of 2000, when the sale of a majority stake in POAS (a petroleum distributor) and of a third GSM (global system for mobile communications) license pushed sales above US\$5 billion, privatization has regularly returned less than US\$1 billion per year.

The privatization of large holdings, such as in telecommunications or state banks, remains the responsibility of line and state ministries. This approach has led to delays, the decapitalization of state enterprises, and resistance to privatization. Turk Telekom, for example, is the last surviving state telecommunications monopoly of the Organisation for Economic Co-operation and Development (OECD) countries. The cross-subsidy mechanism between profit-making companies and loss-makers in the state portfolio furthermore has weakened incentives for the managers of loss-makers to restructure their companies and to improve operational performance. Many companies as a result have been transferred to the Privatization Administration (PA), often remaining with it for years. The PA has effectively become a large state holding group, a function it is not equipped to handle.

The most important privatization objective, to make Turkish industry more efficient, innovative, and competitive, has been made subordinate to attempts to maximize privatization revenue generation, with the purpose of mitigating fiscal problems. It also has given way to political concerns about the rights and privileges of public sector employees. Privatization delays have contributed to the uncertainty that surrounds the question of the irreversibility of structural reforms, and public enterprises and state banks, the traditional vehicles of state intervention in the economy, remain largely in place. State-owned enterprises, mostly in strategically important branches of the economy, are thriving on the regulatory limitations of free markets and on government support, enjoying preferential treatment in public procurement and easier access to

financing. Given these circumstances there obviously is little incentive for them to look for innovative, cost-efficient, or more competitive products.

Large private family firms

Turkey's large family firms typically have their origin in state contracts and connections that reach back many decades, often being founded as construction firms that subsequently have diversified to become multi-sector conglomerates. These firms typically perceive regulatory deficiencies and bureaucratic red tape as relatively less troublesome in business than the challenge of coping with macroeconomic instability. Most have learnt over time how to negotiate regulatory obstacles or otherwise to play the system for business advantage; in contrast, chronic macroeconomic instability is a major obstacle for doing business in general and in particular is a deterrent to investment in innovative, high-risk industries. High levels of inflation and the unpredictability of the inflation rate are the principal rationale behind a business strategy that for the most part takes a short-term horizon and that is characterized by a conservative approach to business decision-making. Most such firms rely primarily on internal financing.

Small businesses

Turkey's small businesses are in many cases informal enterprises and tend to a large extent to be subsistence businesses, operating to a short-term survival agenda and with limited access to financing. The primary concerns for such ventures typically are the complexity and lack of transparency of business regulations, the tax system, corruption, and red tape. These businesses mostly operate in traditional services, trade, and production.

4 INNOVATION POLICY FOR THE KNOWLEDGE ECONOMY

4.1 TRENDS AND ISSUES

As mentioned in Section 3, some enterprises (and even sectors) of the Turkish economy hold a prominent position in the European markets. The country's competitiveness has depended mainly on its low labor costs, and its most successful enterprises are centered on the processing of materials, the assembly of components, and the commercialization of finished goods. With a GDP per capita of some US\$3,000, Turkey's cost advantage over the more industrialized EU countries is significant, but on a broader scale is being challenged by competition from Eastern Europe and Asia, most notably China. Some industries, including textiles, which employs 20 percent of all manufacturing labor, are under serious threat.

Labor productivity is a good measure of innovation, as it shows the value-added being created by employees. Recent data published by Eurostat (the European Statistics Agency) show that labor productivity in Turkey is about 50 percent of the EU level, comparable to that of Slovakia, Slovenia, Hungary, and the Czech Republic but greater than that of Poland. The disadvantage incurred through the productivity gap between Turkey and the EU leaders in productivity is to a large extent diminished by the existing intersectoral differences: in industries that require large amounts of labor, for example, Turkey seldom is in direct competition with these other economies.

However, in Turkey, perhaps more than in other comparable countries, the business universe is divided into two: modern firms with labor productivity at levels of about 60 percent of that of the global leaders, and traditional firms where labor productivity may be only 25 percent of that of the industry leaders. With the exception only of industries requiring large capital investment and of the banking sector, this division is evident across all sectors. There is no middle tier of enterprises between these two sub-universes,⁷ with the result that the industrial network that should link state-owned businesses, large private conglomerates, and small enterprises is underdeveloped.

The weakness of the network linking large companies and small businesses is a significant obstacle in particular to the generation and commercialization of knowledge. In successful knowledge economies this network is dense and there is a constant flow of goods and services, staff, and innovations between the two groups of businesses. In Turkey, in contrast, large private companies tend to look for in-house solutions to business problems, expanding their conglomerate structures rather than outsourcing to external businesses. This is partly explained by the traditional operation of family-owned businesses, but there clearly is a significant gap in the business

⁷ McKinsey study talks about a bi-modal economy. See McKinsey Global Institute, "Turkey, Making the Productivity and Growth Breakthrough." (2003)

culture between these two sub-universes. Small enterprises in Turkey mostly remain concentrated in traditional, low-technology lines of business, and their staff typically are poorly qualified. Firms from the informal sector by definition are excluded altogether from the network.

Studies examining the competitiveness and productivity of Turkish industries and their determinants show that these could be significantly improved if the relative importance of the informal sector, and particularly that of the small-firm segment, were reduced.⁸ This would require regulatory actions in areas including those of tax, labor, and subcontracting. The fact should not be overlooked, however, that the existence of an informal economy provides an element of flexibility for the economy as a whole, in particular helping the labor market adjust in times of economic slowdown.

Surveys indicate that Turkish industry has significant innovative dynamism.⁹ Patent deposits, which may be taken as an indicator of technical creativity, are however low. This is particularly true of patents deposited at the international level, such as at the European Patent Office or the U.S. Patents and Trademarks Office (USPTO) (see Annex 2). The number of patents deposited in the Turkish patents system is significantly higher, but nonetheless is overwhelmed by external patent applications: in 2002 there were 388 domestic patent applications, compared to 1,490 applications registered by foreigners.¹⁰

R&D investment is low in absolute terms, but at about 0.65 percent of GDP is at a reasonable rate given the level of development reached by Turkey in terms of GDP per capita. It furthermore is increasing over time. The number of scientists and engineers in the R&D system is 11 per 10,000 population, compared to the 30 per 10,000 EU average. The proportion contributed by the business sector to total R&D expenditure is about 35 percent, compared to the OECD average of 65 percent, but it should be noted that the number of companies conducting R&D increased by 58 percent between 1996 and 2000. More than 60 percent of R&D is undertaken in the university sector (the OECD average is 25 percent). Most other R&D work is undertaken in government laboratories, operated principally by the Scientific and Technical Research Council of

⁸ McKinsey Global Institute, op.cit.

⁹ In the period 1995–97, 25 percent of manufacturing enterprises and about 50 percent of services-related firms reported undertaking innovative activities (generally defined as the introduction of a new product to the market within the last five years). Innovation surveys are ongoing into more recent developments. See Innovation Policy Profile in Seven candidate Countries: the Challenges, Innovation Policy Profile: Turkey, EU Enterprise Directorate-General, March 2003.

¹⁰ There are a few success stories that deserve to be mentioned and that point to a latent creativity that should be properly encouraged. For example, the Doplo, an innovative small convertible truck was created by Turkish designers for Fiat and now is broadly produced and sold worldwide; design and packaging developed by large agricultural cooperatives have helped in expanding export markets; and the upgrading of white goods productions (in which Turkey is a leader) has benefited from investment in quality and R&D.

Turkey (TUBITAK, for civil research) and by the Ministry of Defense (military). Almost all of the R&D infrastructure is located in the Ankara and Istanbul regions.

4.2 THE INNOVATION CLIMATE

A rough benchmarking of selected variables of the innovation climate in Turkey is provided in Figure 2. This scorecard gives an idea of the relative strengths and weaknesses of Turkey in innovation; generally, Turkey is stronger than the Europe and Central Asian countries taken as a whole in terms of inputs (for example, enrollment in science and technology (S&T) courses) and weaker in terms of outputs, such as high-technology exports.

Turkey also scores well for entrepreneurship among managers. This spirit of entrepreneurship is most apparent among larger firms, but it also is manifested among small businesses, enabling them to survive and prosper in what can be a difficult business environment. Turkey also is relatively strong in terms of its “technical culture,” with a comparatively large proportion of its educated population strongly attracted by science and engineering studies. The output of Turkey’s research system, as measured by bibliometric indicators (that is, the volume of published works), is significant and rising.¹¹

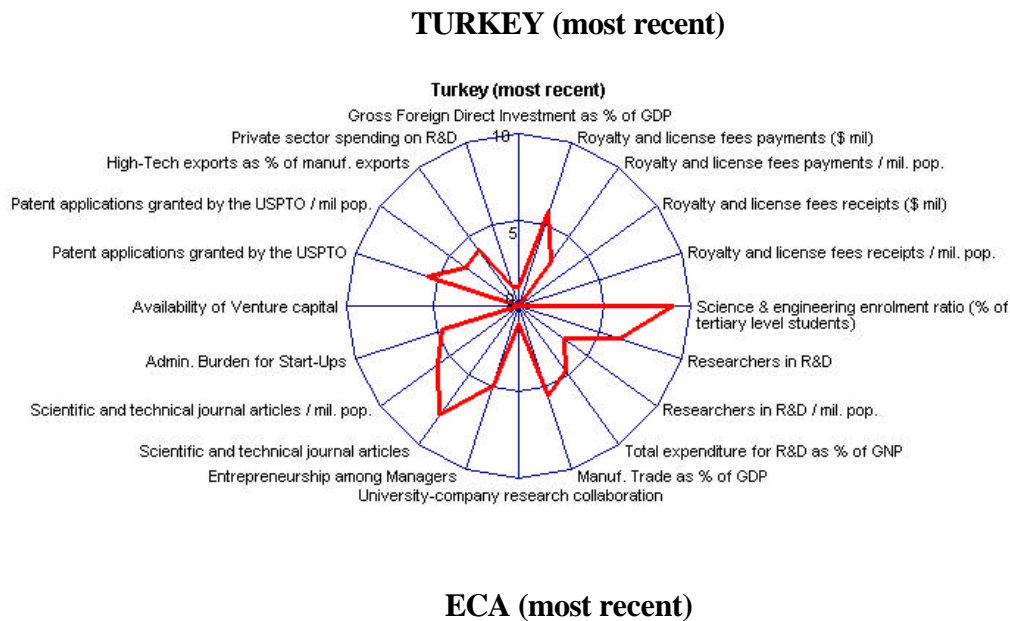
Mobilization of this entrepreneurial and scientific/technical capability is hampered by the country’s excessively bureaucratic environment, an inappropriate legal system, and a lack of financial resources for innovative undertakings, however. Turkey lacks a “growth path” that would enable small businesses to build on their entrepreneurial strengths and innovativeness. The inability of the system to generate more innovative small firms is perhaps one of the biggest weaknesses of the Turkish economy. Symptomatically, during the global dot-com frenzy of the 1990s there were no dot-com initial public offerings (IPOs) at the Istanbul Stock Exchange.

The weak inflow of foreign direct investment (FDI) similarly is an important impediment to the growth of knowledge-intensive businesses. FDI not only is an important source of nondebt financing but also is a source of new products, know-how, and new technologies, but while in the last 15 years FDI worldwide has increased by a factor of 12, Turkish FDI levels have stagnated. The country has failed to attract the substantial FDI inflows that might be expected for a nation of its large market size, strategic location between Europe, the Middle East, and Central Asia, and low-cost manufacturing potential.

¹¹ Publications by Turkish scientists, residing in Turkey, increased from 449 in 1980 to 6,662 in 2001, a nearly 15-fold increase. This output elevated Turkey from 44th to 25th in the world in less than two decades (Kemal Gurz and Kemal Pak, *Globalization, Knowledge Economy and Higher Education and National Innovation Systems: the Turkish case*, presentation at the conference on Education, Lifelong Learning and the Knowledge Economy, Stuttgart, October 9-10, 2002, mimeo)

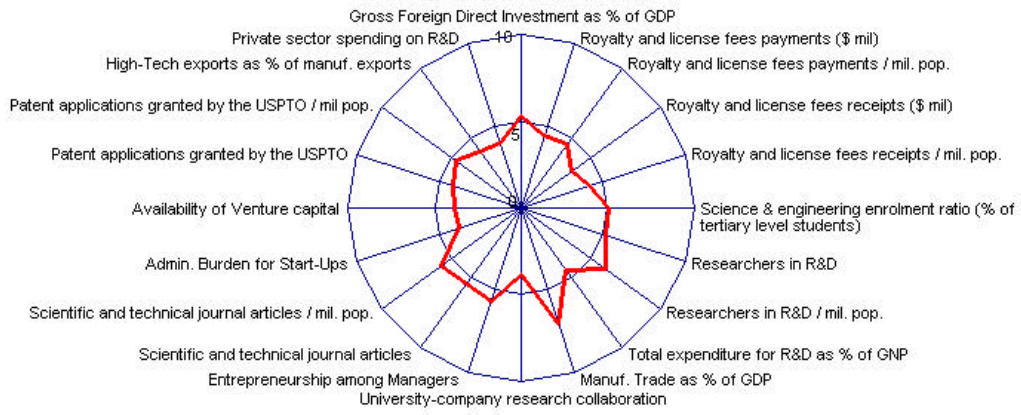
The slow inflow of FDI has its roots in many factors, including administrative barriers, macroeconomic volatility, and lack of political will (as evidenced by Turkey’s weak attempts at privatization). These factors are discussed in depth elsewhere in this study, as the decisions governing FDI have many similarities with the decisions that underlie investment in knowledge-intensive products and technologies.¹² Turkey is one of the few countries that has not yet established a promotion agency for FDI. The creation of such an agency would not guarantee an increased inflow of FDI, but the failure to introduce one significantly is symptomatic of the Turkish government’s attitude toward foreign investors.

Figure 2. Innovation Variables (WBI Scorecards)



¹² Administrative barriers to FDI are analyzed in detail in “A Diagnostic Study of the Foreign Direct Investment Environment,” FIAS, World Bank, Washington, D.C., February 2001.

Europe and Central Asia (most recent)



Box 1. Private Universities in Turkey as a Source of Innovation

Turkey's private universities, all of which were established as nonprofit foundations, are a major strength of the country's innovation system. The first such university was established 20 years ago in Ankara, and nonprofit universities now account for 23 of Turkey's 76 universities. The remainder are state universities. Private nonprofit universities, while representing only a small percentage of the total tertiary enrollment, tend to select the best students. They suffer, however, from an ambiguous status, being part of the country's Higher Education Council but denied voting rights. The following are three examples of these innovative undertakings:

- *Bilkent*. Established in 1984 in the southern suburbs of Ankara, with the ambition of becoming the Turkish MIT (Massachusetts Institute of Technology), Bilkent is supported by a major enterprise operating in the building and infrastructure business. The university has some 15,000 students, with international faculties in all fields and courses taught in English. It is Turkey's leading source of science and engineering publications (as assessed in terms of articles published in international journals). Bilkent has become the nucleus of a rapidly growing city built around its campus.
- *Bilgi*. Established by a young entrepreneur and graduate of Cambridge University in England, Bilgi is situated in the poor Kustepe and Dolapdere districts of Istanbul. It supports some 6,000 students, one-third of whom attend on university tuition scholarships of US\$6,000 per year. Bilgi focuses on the social sciences and business management. It has developed ties with the London School of Economics and notably has instituted a series of innovative programs, including an e-MBA (electronic masters degree in business administration); media, IT law, and design and business courses; and a night program in computer learning for local people.
- *Koc*. Created by an industrialist in 1993 and funded by the Koc Foundation, which also supports primary and secondary schools, Koc comprises three colleges for science and arts, business, and engineering. The main university campus is in Sariyer, 30 kilometers north of Istanbul at the meeting of the Black Sea and the Bosphorus. Faculty members are graduates mainly of U.S. and European schools, and include many returning Turkish scientists. The university has 12,000 students, one-third of whom are granted tuition scholarships valued at US\$11,500 per year. The engineering college has won contracts with Nokia and Mitsubishi, among others.

The quality of university-based education is high in those institutions that have international linkages, but the system otherwise demonstrates problems of quality, access, governance, and financing (see also Section 5). While there evidently is sufficient intellectual potential to support the development of certain universities as centers for innovation and the commercialization of ideas, links with industry are poor, in part due to inadequate funding for cooperative projects and in part to the limitations of research laboratories and equipment. Attitudes and incentives also may be an important factor: University professors tend to be preoccupied with theoretical

work and businessmen typically seem unaware of or disinterested in the scientific and technical potential of universities. Only 50 percent of the funds committed to all projects agreed between a university and an enterprise stays with the involved party, 35 percent goes to the university common funds, and 15 percent goes to the Treasury.

Universities also typically do not prepare their students for future cooperation with industry. While several tertiary establishments have high-quality management and technology courses, the number of highly educated students that go on to create their own enterprises is small. The most promising source of future university–industry cooperation lies probably in academic activities and infrastructure funded by big business (see Box 1).

4.3 INNOVATION POLICY DIRECTION

Turkey has a considerable infrastructure of policy bodies focused on innovation and R&D. These include notably the following:

- SCST (the Supreme Council of Science and Technology)
- TUBITAK (the Scientific and Technical Research Council of Turkey (an operational arm of the Supreme Council))
- TTGV (the Technology Development Foundation, focused on innovation support)
- HEC (the Higher Education Council)
- KOSGEB (the Small and Medium-Size Industry Development Organization)
- SPO (the State Planning Organization)

Turkey has designed and developed its innovation policy essentially around TUBITAK.¹³ The policy in recent years, supported by two Bank-financed projects (see Box 2), has aimed principally at building infrastructure to raise the technological level of Turkish industry. The major achievements of these activities include:

- the building of a metrology institute;
- the upgrading of the Patents Office;

¹³ For a detailed presentation and analysis of the different policy measures taken by the Turkish government see the Policy Profile published by the European Commission, op.cit.

- reorientation of the Marmara Research Center, a major R&D institute operating under TUBITAK, to better serve the interests of business and industry;¹⁴ and
- establishment of the TTGV to support innovative projects, primarily those initiated by small and medium-size enterprises (SMEs).

The two major policy components developed over 1998–2002 by the TTGV (with Bank support) are an innovation financing program that has supported some 100 enterprises with reimbursable subsidies, in a total amount of US\$32 million, and the provision to 500 SMEs of fee-based technical services, amounting to US\$2.5 million. Other recent TTGV initiatives include a US\$12 million investment in two technology parks and a US\$7 million in two venture capital companies.

TUBITAK-TIDEB (a fund for industrial R&D) has provided:

- Support for industrial R&D projects, in the form of soft loans with long repayment periods, and grants. Between 1996 and 2002 some 1,200 projects benefited from this scheme, which furnished loans from the state budget totaling US\$97 million.¹⁵
- Support for industry–university collaboration, in the form of joint projects or joint R&D centers. Sixteen proposals have been received and three centers created, specializing in ceramics, textiles, and automotive components. The financial support provided by TUBITAK, capped at US\$100,000 per operation, is modest, but the level of involvement of the business community has been encouraging: the ceramics center at Eskisehir, for example, has attracted 19 industrial partners.
- Tax incentives for R&D, in the form of a postponement of 20 percent of corporate tax for a period of three years, without interest charges. Fewer than 24 firms per year have benefited from the scheme.

The State Planning Organization supports the development of R&D infrastructure in universities and other public research institutions under its Advanced Technology Program. TUBITAK assists the program through its evaluation of candidate projects. The SPO also financially supports know-how creation, new products and processes development. The scheme has a budget of US\$100 million and has contributed to significant developments in several universities. Also, the SPO is expanding its role to support innovative solutions adopted by SMEs.

The agency responsible for SMEs, KOSGEB, also has been providing support for innovation through its Technology Development Centers, incubators, and technical and financial support. Since 1997 some 200 enterprises have benefited from this scheme, leading to the creation of about 1,000 jobs. More convincing, although also of

¹⁴ The Marmara Research Center—the core of the TUBITAK system—has a US\$18 million annual budget and employs some 500 persons, two-thirds of whom are researchers and technicians.

¹⁵ Innovation report prepared by professor Cemil Arikan for TUSIAD, 2003

modest scale, has been the establishment of a number of technology workshops that provide shared facilities and equipment for businessmen and craftsmen.¹⁶

¹⁶ Thirty-five ORTKAs and ORTLABs have been established in eight different sectors. A soft loan of up to US\$300,000 is available from KOSGEB; premises and staff are provided by the chamber or sectoral organization.

Box 2. World Bank-Financed Industrial Technology Projects in Turkey

The first Technology Development Project supported by the World Bank in Turkey provided US\$100 million over 1991–1998 for the improvement of technology infrastructure and services. The project supported the strengthening of Turkey's metrology, standards, testing, and quality (MSTQ) infrastructure by assisting the Turkish Standards Institute (TSE) in standards preparation, product certification, and testing; and it helped strengthen the metrology services provided to industry by the National Metrology Institute (UME) through investment in physical infrastructure, equipment, technical assistance, and training. The project also supported the establishment of the Technology Development Foundation of Turkey (TTGV), which was instrumental in initiating a culture of technology finance in Turkey. Conditional loans were provided to firms to help them introduce new products and processes, including through the purchase of expensive proprietary technologies.

A second loan of US\$155 million was approved in 1999. The resultant Industrial Technology Project had two main objectives: to bring Turkey's technology infrastructure into compliance with World Trade Organization (WTO) and EU standards; and to upgrade the technology services available to Turkish firms. It included the following goals:

- Compliance of Turkey's intellectual property rights (IPR) regime with WTO requirements (US\$15 million). Components of this goal included the upgrading of TPE facilities; improving awareness of IPR laws among industry and the research community; and strengthening IPR enforcement through the training of judges, lawyers, and related personnel.
- Improvements in metrology (US\$43 million), through the broadening of industry coverage of UME's facilities; expansion to new areas such as chemicals and medicine; and increasing awareness of the service among SMEs.
- Orientation of technology institutions to industry (US\$33 million). The main steps to this goal were transformation of the Marmara Research Center (MAM) into a contractual research center, generating income from private industry; the upgrading of laboratory infrastructure; decentralization of responsibilities; and the training of staff in interacting with the private sector.
- Provision of financial and nonfinancial support services (US\$60 million), including the provision of matching loans to firms for technology upgrading (US\$32 million); the provision of fee-based technical support services (US\$3 million); improvement of university–industry links through the creation of technoparks (US\$16 million); and the piloting of venture capital funds (US\$7 million).

At the end of 2003 the following progress was reported:

the UME upgrading and TPE modernization were on target;

- the reorientation of MAM produced 35 percent cost coverage through the institute's revenues (two-thirds of which came from the Turkish defense industry); and
- the Technology Development Financing scheme provided 172 loans to private firms, and Technology Support services assisted more than 500 SMEs.

Two technoparks and two venture capital funds additionally were in development.

The Turkish government recently has introduced a tax incentive aimed at boosting R&D work at technoparks. In a move that has no apparent precedent in OECD countries, and that should be viewed therefore with some circumspection, the government has decided to give a full tax exemption until 2013, from corporate and income taxes to any business R&D activity that takes place in designated areas on university campuses. This decision risks seriously distorting the competitive environment, and introduces questionable privileges that will be awarded nontransparently to a small segment of the population. The stimulus for innovation that the measure provides furthermore is uncertain: tax incentives on innovation-related incomes conventionally are provided for risk-taking initiatives (such as investment in a start-up venture) or are results-oriented (such as tax relief on the capital gains generated by a successful project); they rarely are made on general revenues. The measure additionally runs the risk of diverting the attention of universities from their teaching and research mission into real estate operations.

The most successful technopark developments furthermore have taken place in ventures not sponsored by the government. For example, in the Istanbul area the local municipality has developed the Gebze Industrial Park¹⁷ and through the use of efficiently managed incentives has attracted many participants, including foreign enterprises.¹⁸ In Ankara the Middle East Technical University campus has attracted about 50 enterprises to its technology park. Bilkent University plans to host some 70 companies at its Cyber Park, which is being financially supported by the TTGV.

Turkey's association with the EU Framework Program also is expected to aid research and development. The program is intended to facilitate the integration of Turkish R&D teams with European networks and to provide support to those benefiting from related funding. For example, the Marmara Research Center (MAM) has applied to the program with 101 "expressions of interest;" 10 projects have been retained following a first selection in which MAM has senior partner status, and the center expects to win an earthquake research project in which it will be lead partner. If this latter project is accepted the associated award would fund 10 percent of MAM's needs for the next five years. In more general terms, more effort is needed to increase the number of viable proposals coming from Turkish research institutions.¹⁹

Finally, it should be mentioned that TUBITAK coordinates an ambitious long-term government strategic planning activity, entitled Vision 2023, that aims to formulate a

¹⁷ The park was created 15 years ago and today creates US\$500 million of exports and employs some 10,000 people. The park has begun to develop a technology area with an Israeli partner, and already is attracting the first high-tech enterprises (including Logo Business Services, Turkey's first software producer and exporter, employing 300 people).

¹⁸ As noted in a FIAS/IFC, Turkey: Administrative Barriers to Investment , 2001, Washington DC.

¹⁹ More on:

5th Framework Programme: http://dbs.cordis.lu/fep/FP5_MS/ms_tr_en.html

4th Framework Programme: http://dbs.cordis.lu/fep/FP4_MS/ms_tr_en.html

6th Framework Programme: <http://fp6.cordis.lu/fp6/home.cfm>

vision for the development of the Turkish technologies and industries through identifying their strengths and weaknesses and related opportunities. Vision 2023 consists of 4 sub-projects: Technology Foresight Program, National Technology Inventory, Turkish Researchers Inventory and National R&D Infrastructure Project. In the context of the Technology Foresight Program, 10 sector panels and 2 thematic panels have been established. Final panel reports for the sectors and roadmaps for 86 priority areas have been prepared.

4.4 POLICY OPTIONS

The Turkish authorities clearly need to build a more efficient innovation system. It is important that those measures that have been taken over the past decade be brought together with policy measures that have been proven effective in other, more advanced countries. There first and foremost is a need to mobilize stakeholders to drive these policy actions. Experience elsewhere shows that government or semigovernment bodies are not the best candidates to guide such programs; in particular, a more prominent place needs to be given to the business sector. The most crucial actions in this area, drawing upon international experience, are as follows:

Expanding and decentralizing innovation support services and policies

There is a need to strengthen the innovation support services, both technical and financial, and particularly those that are directed at serving SMEs and small entrepreneurs. As demonstrated by the TTGV experience, there is significant demand from SMEs for technical training, assistance, testing, and information services and for financial support. The structures best suited to meeting this demand are those which are locally managed and which are well-connected to the central institutions that are the key sources of information and resources. In the Turkish context it would seem appropriate to mobilize the local chambers of commerce or similar organizations to run such bodies, with the government providing infrastructure funding and innovation funds (with at least some signature authority vested in the local management body). The experience gained through the KOSGEB common workshops for artisans and the TUBITAK university–industry centers suggests that this approach furthermore can be scaled up. ANVAR, the French national innovation agency, could for example serve as a useful model for a scaled-up, decentralized TTGV.

It also is important that regional S&T innovation councils be established, with significant involvement of local business communities. These bodies should oversee the development of local initiatives, notably the decentralized support services cited above, as well as other relevant actions, notably in the field of education (see Section 5). This overall effort would fit well with the plans of the Turkish government to devolve larger financial and administrative responsibilities to the regional and local authorities.

Promoting industry that is competitive on the world stage

There is a need to support enterprises that are able to compete on the world market. The promotion of such ventures should furthermore be made with a view to creating a nucleus of new industries that together could be significant sources of jobs, exports, and so forth.²⁰ The *Fundacion Chile*, a private-sector-driven entity that has all of the necessary instruments to promote innovation, could be taken as a model for this endeavor. The foundation seeks out promising embryonic technologies, creates enterprises for resale to local or foreign buyers, provides technical training, and so forth. Several of the new industries that it has originated in Chile, including fish farms and vineyards, are now competitive on the world market. With the income generated by a few successful products the foundation has recovered all of the expenses it has accrued since its inception a decade ago. A similar structure, of a public nature but with a private-sector orientation, could be established in Turkey with the funding from the main business associations (TUSIAD, TBV, TIM, and others). Such an agency could be set up as a subsidiary of TTGV.

Stimulating industry–university collaboration

There is a need to strengthen the collaboration between industry and academia. Both actors are dynamic in their own way, but they do not collaborate effectively. The government has taken some measures to foster this collaboration, notably through the development of science and technology parks and the introduction of strong tax incentives for R&D enterprises to set up in those parks, but the efficiency and equity of such measures are debatable. The grant-based incentives already introduced to stimulate the development of joint R&D projects or the establishment of joint R&D centers could be more effective if increased, however.

The government needs also to stimulate the demand within the business sector, and particularly among SMEs, for R&D. Measures specifically addressed to SMEs, such as systematic partial subsidy (50 percent) of contracts made with university or government laboratories, could encourage small enterprises to contact these research structures, and subsidy of the cost of employing scientists and engineers could help strengthen in-house R&D capabilities. Finally, it is of utmost importance that counter incentives, such as the 50 percent retention by universities of consultancy contracts signed with individual academics, be removed. In addition to discouraging businesses from using the research potential of universities, this practice also is open to abuse by consultants—it is not unknown that academics will register as an employee of an R&D firm established on a designated R&D campuses, and thus benefit from the tax exemptions made available to the firm.

²⁰ This is currently envisioned by KOSGEB.

Taking advantage of FDI and responding to related technology needs

The government has acted to encourage a greater inflow of FDI, but it should be noted that the positive role of FDI is not unconditional. New technologies and management techniques “travel” with the FDI only when the recipient country has available the R&D and managerial cadres and institutions able to adapt those incoming technologies to local requirements and conditions. It is essential, for example, that the receiving community be organized to respond instantly to any demand that arises for skilled labor. The business sector, educational institutions, and local and central authorities must work together to achieve this. Turkey can draw on past experiences in this regard (for example, it should look to the training schemes in metalworking that were provided to serve the burgeoning automotive industry), but it also should address the need, for example, to reform its vocational schools and to move forward on the proposed Regional Technical Colleges (see Section 5). It also is important that measures be taken to facilitate the transfer of technology from foreign firms to Turkish ones. Domestic suppliers of components and materials in particular need technical support and legal assistance in the areas of technology licensing and acquisition. Countries such as Ireland, Malaysia, and Hungary have developed competitive, foreign-owned industries and a review of their experiences could be informative.

Expanding innovation policy ownership

Turkey’s innovation policy initiatives have to date mainly been the province of TUBITAK and TGGV. There is a clear need to enlarge this constituency to include other state agencies and to involve representatives of business organizations. Finland, a leading country in the knowledge economy and the world model for innovation promotion, operates a Science and Technology Policy Council led by the Prime Minister and including the key Ministers of Education, Finance, Labor, and Industry and top representatives of the business and labor associations. The council has played a key role in the management of the national innovation system and as a result the development of the country. Turkey similarly has established the Supreme Science and Technology Council, but although the council includes senior government policymakers the business community and labor union are poorly represented. It furthermore has not met for the last two years till February, 2004. The council should be reactivated, its responsibilities strengthened, and nongovernmental members appointed. It also should seek to develop close links and coordination with the country’s regional innovation bodies.

4.5 CONCLUSIONS

Turkey has a clear need for a better climate for innovation and enterprise creation. An audit, to be conducted under the joint auspices of the business sector and the government, should be made of the areas of greatest importance for entrepreneurship and innovation. This should seek to identify how successful have been the measures already taken, such as that to reduce to one day the procedure for enterprise

registration, and should seek to identify necessary improvements in areas such as procurement policy, customs regulations, technical norms and regulations, the patents regime, and so forth.²¹ Post-audit measures should be proposed and the audit commission should systematically follow through their application.

Changes in innovation policy additionally should be monitored continuously for their impact on innovation and new venture start-ups and for their subsequent economic outcomes (such as the creation of jobs and exports). The goal should be to identify and scale up the most efficient actions and eliminate the inefficient ones. A report (to include the findings of existing studies, e.g. prepared by TUSIAD) should be prepared and broadly discussed and disseminated. It would seem logical that such a work, to be completed within one to two years, be undertaken under the auspices of the reactivated and strengthened Supreme Council for Science and Technology.

²¹ It would be worthwhile examining the problems facing Turkish firms that intend to apply for patents with the USPTO or the European Patent Office. Costs are important for a large part of Turkish industry and support should be provided accordingly.

5 HUMAN RESOURCES FOR THE KNOWLEDGE SOCIETY

5.1 TRENDS AND ISSUES

The trends toward globalization and the knowledge economy are challenging formal and nonformal education systems worldwide to adapt to a new need to support lifelong learning for individuals. The global economy increasingly is driven by knowledge, and countries need a population that is able to create, adapt, and use that knowledge. Governments therefore must transform their formal education systems, stimulating and linking them with nonformal systems, to create an integrated, high-performance learning system. The key challenge for educators is how to provide individuals with access to the knowledge and skills that they will need throughout their life. How Turkey responds to this human resource challenge will govern its economic growth and future social cohesion.

The linkage between the growth or decline of specific sectors of the economy directly affects the overall demand for labor, and affects also the demand for specific occupational skills. The trends in employment by sector, including for example the inevitable increase in employment in sectors that are knowledge-intensive and that use large amounts of information communication technology, will accelerate as the knowledge economy develops. These trends already are emerging in Turkey, causing structural changes in the labor force and introducing ramifications for education and training systems. The key features of the Turkish labor market are as follows:

In 2001 only 45 percent of the adult population was in employment. Twenty percent lower than in recent decades, this is one of the lowest levels of employment in the world. Population growth has outpaced job creation and a large proportion of the labor force, primarily women, is dropping out of the labor market.

Unemployment rates generally increase with education level for those aged under 25 (see Table 2). This partially reflects the fact that educated workers have a higher reservation wage, but follow-up studies of graduates indicate that there are structural problems in the labor market. Education and training evidently are not attuned to the needs of the economy. For example, rigid formal sector employment requirements mean that college graduates tend to find entry into the labor force difficult, and when they do break in, often after several years, they commonly do so in jobs that are not related to their education level. This has serious implications for productivity, as it creates considerable dissatisfaction in an important segment of the population. It also reduces the incentive to seek education.

Table 2. Unemployment in the Labor Force by Age and Educational Level

Age group	Illiterate	No diploma	Primary	Junior (inc. Junior voc.)	High (inc. High voc)	College+	Average
15-19	10.1	15.5	9.8	27.3	62.2	0.0	15.0
20-24	8.2	14.3	12.0	53.0	45.1	30.9	17.8
25-29	6.5	14.3	8.8	8.8	23.1	10.5	9.7
30-34	5.0	6.5	7.5	9.3	10.7	3.3	6.7
35-39	8.0	6.0	7.1	8.2	10.5	3.0	6.5
40-49	6.6	14.2	12.4	11.1	17.8	3.7	10.2
50-59	4.2	8.0	8.0	13.1	13.2	5.1	7.2
60+	2.8	2.1	2.0	16.7	0.0	0.0	2.3
Average	3.3	6.0	7.5	19.4	26.4	7.5	8.5

Source: Labor Force Survey

The structure of the work force notably is changing with the migration of rural workers into urban areas, and out of agriculture and into services (Table 3). Agriculture is still important, employing 35–40 percent of the work force, but employment in this sector is falling. Manufacturing employment in contrast is rising, but it is not keeping pace with the rise in manufacturing value-added. The service sector is absorbing much of the migrant labor from agriculture, but demand from the other major employer of migrant rural labor, construction, seems set to fall away as Turkey's construction boom appears to be nearing its end. This will limit the employment possibilities for the vulnerable group of unskilled adults with only basic education.

Table 3. Employment Is Moving Out of Rural Areas and Agriculture

<i>(as a share of total employment)</i>	1970	1980	1990	1995	1998	1999	2000	2001	2002
Urban			42	47	49	49	54	54	55
Rural			58	53	51	51	46	46	45
Employment in agriculture	63	53	47	43	41	41	35	35	33
Employment in industry	12	15	15	16	16	16	18	18	19
Of which manufacturing	10	13	14	15	15	16	17	17	18
Employment in construction	5	6	5	6	6	6	6	5	5
Employment in services	20	26	33	34	37	36	41	41	43

Source: Bulutay, T. (1995) for 1970-1987; SIS HLFS for 1988-2002.

Labor productivity, measured by value-added per worker, grew through the first half of the 1990s before declining in the second half of the decade. Productivity had increased through the 1980s, particularly in the second half of the decade, to the level of Hungary and Poland, but remained well below the levels reached in Korea, Portugal, and Spain. Labor costs in Turkey generally followed the trend in productivity, differing in that the increase in the first half of the 1990s was steep and

the subsequent decline in wages in the latter part of the decade also was steeper. Labor costs are slightly below those of Hungary, Poland, and Mexico and are well below those of Korea, Portugal, and Spain. Overall, Turkey's labor costs remain competitive.

The labor market may have to adjust further as inflation falls. The high-inflation environment of the 1990s led to considerable flexibility in real wages through the decade, when backward indexation of wages gave rise to inflation inertia in the economy (when inflation falls rapidly, real wages rise; when a crisis hits and inflation increases rapidly, real wages fall). One of the key features of the government's 2000 stabilization program was a shift to forward indexation, to diminish inflation inertia. Success in this area will be important for the sustainability of the disinflation program. If inflation continues to decline as programmed it will be more difficult for wages to serve as the adjustment mechanism in the event of future shocks, with the result that, absent greater productivity, Turkey may lose its competitive advantage.

5.2 HUMAN RESOURCES IN THE KNOWLEDGE ECONOMY: THE EDUCATION CHALLENGE

The trend to emphasize the importance of the learner is increasingly reflected in the literature, but the shift in focus from institutions to individuals raises several questions. What are the key skills that an individual needs in a modern knowledge economy, and how can these be assessed? What challenges do education and training institutions face in responding to demand-driven education and the transfer of the management of learning to individuals? How can individuals be motivated to take increasing responsibility for learning? What information do individuals need to plan their learning? What are the difficulties in recognizing nonformal learning?

Human capital indicators

Secondary school enrollment in Turkey is lower than the OECD average, and the average grade level of the existing work force is about fifth grade (see Table 4). Compulsory basic education has recently been increased to eight years, however, and there are plans to further increase compulsory education to 12 years. The proportion of professional and technical workers in the labor force is only one-quarter of that of Western Europe, and enterprise staff training is low. Public expenditure on education again is lower than the OECD average, but should rise if the level of compulsory education is increased as planned. Information and communications technology (ICT) expenditure is low, as is the access of students to the Internet, but the Ministry of Education is investing in ICT for basic education and plans similar investments in secondary education.

Table 4. Human Capital Indicators

Indicator	Turkey	Europe and Central Asia	Western Europe	United States	G7
Unemployment rate (2002; %)	8.50	9.80	5.50	7.75	8.11
Human Development Index	0.73	0.79	0.93	0.93	0.93
Public spending on education (1999; % GDP) *	3.20	4.86	6.08	4.70	4.99
Primary school student–teacher ratio*	24.00	17.23	16.00	14.00	16.83
Secondary school enrollment (%)*	60.00	83.33	97.00	116.00	109.14
Eighth grade mathematics (1999) ^a	429.00	510.89	502.00	530.00	517.40
Eighth grade science (1999)	433.00	519.67	515.00	545.00	525.80
Gross tertiary enrollment (%)	22.00 ^b	39.06	81.00	56.75	59.57
Gross tertiary enrollment in science and engineering (%)	9.50	10.68	17.20	15.40	16.34
Adult literacy (%)	84.60	97.56	99.00	98.83	99.00
Professionals/technology workers as percentage of work force	6.11	20.86	28.50	27.34	24.86
Extent of staff training (%)	3.00	3.65	5.90	5.65	5.74
Computers per 1,000 people	34	60	513	354	296
Telephones per 1,000 people	279	250	699	596	602

^a Source: TIMSS (International Mathematics and Science Study)

^b If distance learning is included this figure rises to 29 percent

* Presented data is comparable with the data for other regions in the table for 2001. The most recent data for Turkey shows some regres on public spending on education in 2004 budget at 3.06%, and a number of students per teacher in 2003-2004 of 26; enrolment in the secondary schools has improved to 72.3% (MONE)

Source: World Bank Institute

5.3 POLICY ISSUES IN THE EDUCATION AND TRAINING SECTOR

The following analysis examines five policy themes that apply across the entire education and training sector. The analysis examines how these policies affect learning from early childhood to retirement, in both formal and nonformal learning settings. The themes are as follows:

- *Skills and competencies.* The degree to which the human development sector is providing the skills and competencies needed to ensure individuals can function in a democratic knowledge society, and how these competencies are assessed.
- *Governance and administration.* How well the human development system is governed and administered. The analysis includes examination of the role of key stakeholders.
- *Financing.* The degree to which existing and proposed financing mechanisms ensure the quality of and access to education and training. The analysis identifies the principles governing allocation of funds within and between learning systems; the role of public and private financing; and how enrollment and access can be improved while maintaining equity and affordability for the poor.
- *Mobility.* The constraints to mobility both within and between different parts of the learning system.
- *Research and technology.* The degree to which education, science, technology, and research are linked (see also Section 4).

5.3.1 Key Skills and Competencies for the Knowledge Economy

The high level of unemployment in Turkey, particularly among educated youth, points to a potential problem of a structural imbalance between the content and focus of education and training and the skill needs of the knowledge economy. The recent economic crisis is one contributor to unemployment, but investigation of graduate unemployment suggests that this factor does not fully account for the overall problem.²²

A follow-up investigation of graduates of secondary education—in particular graduates of vocational education, who in theory should be fully prepared for entry to the job market—reveals a high level of unemployment among this group. Significant numbers of secondary graduates take Turkish Employment Organization (ISKUR) retraining programs immediately following graduation.

At the tertiary level there is an imbalance between degree programs and short-cycle technical programs (the latter representing a smaller percentage of overall tertiary enrollment compared to the OECD average). The technical work force is small, and there is little nonformal training provided by enterprises, particularly SMEs. Representatives of the private sector suggest problems in this area include a lack of incentives and a need for occupational standards.

²² A 1997 SIS study of formal and nonformal graduates indicated that only about 40 percent of graduates find employment in the area in which they are trained. More recent estimates by the Ministry of Labor put this figure at 18 percent.

These issues, including the teaching of core skills to young people, are a major concern across the OECD countries. A recent OECD project, Defining and Selecting Key Competencies (DeSoCo), identified three broad areas of competence that are needed by a knowledge economy. These are:

- the capacity of individuals to act autonomously and reflectively (requiring an orientation to the future, awareness of the environment, understanding of how one fits into society, a sense of self, and participation in a social field);
- the capacity to use tools effectively and interactively (requiring basic skills; instruments for dialogue; awareness of and willingness to accept new tools; and the ability to use information and communications technology, to use information effectively, and to use language effectively); and
- the capacity to join and function in socially heterogeneous groups (requiring the social embeddedness of individuals; the creation of social capital; a pluralistic society; and the ability to manage and respond to others, to resolve conflict, and to participate in groups).

Turkey should address these issues through the following actions:

Develop occupational standards and assessments for vocational and professional programs

Work in this area was begun with support from a World Bank Employment and Training Project, but the development and updating of the work has paused pending approval by Parliament of related legislation. The work of the tripartite Council on Occupational Standards (MSK) should be continued, as it is this that will provide the basis by which to link the skill demands of enterprises with the supply of labor from the education and training sector. The work additionally should help identify the new and emerging skills that are critical for the knowledge economy. The MSK standards also should assist in the recognition and coordination of competencies within the formal secondary and tertiary education system, and should assist in coordinating the formal and nonformal education elements of the learning system and in providing individuals with an incentive to increase their skills. The standards also are an important element of EU policy, providing a base on which Turkish institutions can build to meet the requirements of the Barcelona Agreement.

In the United Kingdom, the Qualifications and Curriculum Authority (QCA) was organized in 1997 to bring together the work of the National Council for Vocational Qualifications (NCVQ) and the School Curriculum and Assessment Authority (SCAA). The QCA also has additional powers and duties that give it oversight responsibility of the curriculum, assessment, and qualifications across the whole of education and training, from preschool to higher vocational levels. The QCA is a nondepartmental government body under the Department for Education and Employment. In addition to the government, QCA represents schools, colleges, and training providers; regional bodies and professional associations; parents and school

governors; other national bodies in education; and awarding bodies that offer a wide range of qualifications.

More than half of all vocational qualifications awarded in the United Kingdom are National Vocational Qualifications (NVQs). These are based on occupational standards and include knowledge requirements as part of the qualification. They confirm the holder's ability to apply skills and knowledge in the workplace to the recognized national occupational standard.

Reform secondary education, including secondary vocational education, and improve linkages with higher vocational schools (MYOs)

Existing Turkish vocational secondary programs seek to train people in specialized areas, as opposed to providing broad occupational skills in a group of related occupations. The result is that graduates do not have the necessary technical skills to properly fulfill the role of technicians in the emerging knowledge economy and, because of the large amount of time spent in specialized skill training, their general education is weak. Young people as a result are ill-prepared for the emerging and changing knowledge economy and for the demands of lifelong learning. Countries such as the United States, Ireland, Hungary, and Finland have phased out these specialized skill training programs at the secondary level, providing these skills instead in post-secondary institutions or in enterprise nonformal training programs (see Box 3). The Turkish Ministry of National Education is considering changing the structure of secondary education to provide all students in ninth grade with a more thorough general education, replacing the 110 specialized vocational education programs with 28 broad occupational training programs at the upper secondary education level. The responsibility for specialized training increasingly will be transferred to the post-secondary MYO level and to NGOs and enterprises.

Box 3. Vocational Curriculums

In Hungary, the 1990s transition to a market economy saw secondary education undergo a major transformation, including the revision of general education programs to make them similar for all students in the ninth and tenth grades. The number of vocational specialties also was reduced from more than 100 to about 20 vocational orientation programs. Specialized training increasingly has moved to the post-secondary level.

In the United States, as early as 1970 national and state vocational training initiatives emphasized occupational exploration through broad vocational programs. Specialized training increasingly was moved to post-secondary community colleges. For example, Oregon implemented 18 occupational exploration programs in its secondary schools, providing core skills in related occupations to provide young people with the qualification for entry-level jobs as well as for entry to further training.

Increase linkages between tertiary education and business

Turkey needs to strengthen the links between business and education institutions, for example, by including representation from business on governing boards, by using business advisory committees on faculties, and so forth. It may also be beneficial to move the governance and management of MYOs away from the universities, as a means of making MYOs more flexible and responsive to regional needs.

Increase participation in international assessments and benchmarking programs

Turkey participates in the International Mathematics and Science Study (TIMSS) of eighth grade students, and as indicated in Table 4 does not score well. Turkey has participated in the Program of International Student Assessment (PISA) but the country is not involved in the International Association for Evaluation and Educational Achievement Citizenship and Education Study (CES), International Adult Literacy Study (IALS), or the new Adult Literacy and Life skills (ALL). Participation in these programs could provide additional benchmarking of the competencies identified as important by the OECD, and could help identify areas in which Turkey needs to restructure its programs.

5.3.2 Governance and Administration: Increasing Stakeholder Participation

The primary governance issue in Turkey's human development sector is centered on tertiary education.²³ First, there is a need to increase the external influence on tertiary institutions. The existing tertiary education executive boards do not have external or student membership, and it is rectors that chair the boards. Second, there is a question regarding the appropriateness of the universities, which respond to national long-term needs, managing the higher vocational schools (MYOs), as the MYOs prepare technicians and need therefore to respond to regional needs. Third, there is a need to ensure that the highest possible caliber of talent is recruited at the rector level. Specifically, there is a need to remove internal intrigue and external politics from the selection process. The alternatives to the existing structures are as follows:

Change the approach to governance of universities

The internal executive board could continue in its present role, but a separate governing board should be established that has at most 15 members, including a minimum of 20 percent external members and student representation, and that has a lay person chair chosen by the members of the board. A maximum of 10 percent of the board members should be nominated by the government.

Change the approach to governance and administration of MYOs

Consideration should be made to separating the MYOs from the universities and establishing them under a national agency governed by social partners, perhaps reconstituted as regional technical colleges. The proliferation of small MYOs (Turkey now has more than 450 of these) do not provide the comprehensive services needed nor are they, from an administrative point of view at least, cost effective. MYOs should have individual governing boards that include their social partners, should have a lay member as chair, should establish their own criteria for appointing staff, should develop the necessary programs as articulated by local businesses, and need better facilities and equipment.

Appointment of chief officers for universities and MYOs

Open competitions, inviting external applications, should be instituted if the universities and MYOs are to attract the highest caliber of talent. The search and selection committees should have external members (that is, the reconstituted governing bodies), and the final decision on the appointment of chief officer should be made by the governing body.

²³ The government is moving toward decentralization, which will also impact the operation of public schools .

Create business advisory boards

Business advisory boards should be established at the institutional, and possibly faculty levels, to facilitate, strengthen, and formalize linkages with business. The boards should provide advice on the skill needs at the national and regional levels; assist with training internships, including the recognition of nonformal training and placement of graduates; advise on curriculum content; provide linkages for R&D and technology transfer; support fund raising; and be advocates to government and the public for the institutions.²⁴

5.3.3 Financing Education

The issues of finance, universal access, and equity are directly linked. The public financing of the formal education system in Turkey is flawed. About 4 percent of GDP is allocated to the sector, which is significantly less than the OECD average of 5.4 percent, and participation levels in secondary education (60 percent), tertiary education (29 percent), and nonformal training (3 percent) are low by international standards. There are multiple options for financing education and training, particularly in the tertiary and nonformal sectors, that need to be considered, as follows:

Basic education

Enrollment in basic education is about 95 percent. Financing is in place, but equity and access problems persist in rural, poor, and some urban areas.

Secondary education

The government plans to increase enrollment and completion in secondary education from about two-thirds to full enrollment over the next five years. This will require greatly increased expenditure in the sector, bringing Turkey nearer to OECD norms. This will likely only be achieved through the identification and contribution of additional public and private resources, however. Access to education nonetheless can be improved, and the cost of secondary education can be reduced if a more appropriate general education is provided to students in lower secondary school (ninth grade and below) and more generalized, lower-cost vocational training provided to the upper secondary grades. Short-cycle, highly specialized training should be shifted to the MYOs and to nonformal training in the private and NGO sectors. Decentralization and the use of school-

²⁴ The Norwegian higher education boards, for example, have nine, 11, or 13 members, comprising a rector, prorector, two to five members elected from among the academic staff, one or two members elected from among the technical and administrative staff, two or three members elected from among the students, and two to four external members. The rector chairs the board. In Australia, boards are comprised on average of 39 percent membership drawn from the university community (including executive, academic, and general staff and the student body) and external representation comprising members of business and the professions (31 percent), community representatives (10 percent), alumni (6 percent), public servants (6 percent), and politicians (4 percent).

administered development funds could assist individual schools to address unique local problems in a more targeted and efficient manner.

Tertiary education

The enrollment gap in tertiary education presents a serious financing challenge. The government cannot and should not attempt to close this gap with public funds. There is a need to identify ways of increasing the support from private sources (that is, through tuition fees and contributions from the business sector), but equity and access for the poorer elements of the population must be maintained. There are also issues regarding the process by which public funds are allocated to tertiary education. Institutional budgets tend to be based on historical costs, but the unit cost of similar programs can vary widely; there is micro management by the Ministry of Finance (MOF) and little freedom to move funds between line items; a portion of revolving funds furthermore is recaptured by the government and there are disincentives for entrepreneurial activities. There additionally is little dialogue during the budgeting process between YOK, MONE, the SPO, and MOF.

Enrollment in tertiary education and training is about 35 percent (compared to the OECD average of 57 percent), with most enrollment being in graduate and degree programs rather than in MYOs (MYO enrollment is 18 percent of tertiary enrollment, compared to 30–40 percent across the OECD). The total enrollment, and the proportion of enrollment in lower-cost, short-cycle technical programs, needs to be increased (the costs of these programs additionally is considerably less than that of a four-year degree program). Consideration should be given to creating incentives to: (a) increase the number of and enrollment in private nongovernmental institutions (now at 3.2 percent, which is low by international standards); (b) expand enrollment in MYOs to 30 percent, (c) expand distance learning; (d) increase tuition from the less than 5 percent (net) to the levels comparable with other accession countries; and (e) expand the loan scheme, applying it to all distance learning participants (that is, by removing the restrictions that essentially disbar those who are unemployed from applying for loans).

Finally, the process of financing tertiary education needs to be restructured. Block grants to universities should be considered, with the recipient university required to match spending annually to a balanced budget, with any overspend to be charged to the following-year budget; there should be greater freedom to move funds between line items and to carry over funds from one year to the next; and MOF oversight of each institution should be removed. It also would be worthwhile considering funding to a formula that uses unit cost and national expenditure data by program and university, with small set-asides for YOK funding of national priority projects. The issue of low faculty salaries also should be addressed; for example, members should perhaps be permitted to take on limited consulting assignments, annual salaries could be disbursed over nine months, and salaries could be decoupled from the civil service.

Table 5. Proportion of Enrollment in Private Tertiary Institutions in Selected Countries

Country	Percent
Turkey	3.2
Latvia	11
Bulgaria	12
United States	18
Romania	25
Poland	30
Portugal	35
Netherlands	53
Brazil	59
Indonesia	63

Table 6. Proportion of Tuition Financing of Tertiary Education in Selected Countries

Country	Percent
Turkey	3
Poland	7
Romania	12
Lithuania	18
Slovenia	19
Spain	20
Korea	23
Australia	30
Bulgaria	42

Adult continuing education

Investment in training by individuals (workers) and enterprises is low in Turkey, and there are few incentives that would change this situation. This is particularly true in the large SME sector, which to a large extent comprises ventures that have developed out of a family linkage. High unemployment, low levels of education in the work force, and the existence of a large informal SME sector that can undercut formal sector wage costs exacerbates the problem.

If Turkey is to compete in the knowledge economy, particularly in the export and international markets, it must upgrade the skills of its work force. Specific financial and other incentives should be considered to encourage individuals and enterprises, particularly in the SME sector, to invest in skill development (see Table 7). These could include but should not be limited to: (a) tax incentives for individuals and enterprises; (b) targeted incentives to stimulate the delivery of high-priority

knowledge economy services by public and private service providers; and (c) initiatives to promote skill development in SMEs in both the formal and nonformal sector.

Table 7. Options for Financing Education and Training

Who Ultimately Pays	Who Finances	Collection	Instrument
Student	Student	–	Education savings account
	Private	Private	Private capital loan; human capital contract
		Public	Income-contingent loan Human capital contract
	Public	Private; public	Private collected public loan; public loan; income-contingent loan; graduate tax
		Community	Individual development account
Employer	Private	–	On-the-job training; training levy; payroll tax
	Public	Public	Employer graduate tax
Government (tax payer)		–	Direct funding; grants; vouchers; interest subsidy loans; tax credit

5.3.4 Mobility

Turkey needs also to promote learner mobility. This requires the creation of alternative pathways to and increasing the recognition of qualifications gained in formal, nonformal (enterprise training), and informal learning systems (self learning). The movement of graduates of secondary education, particularly vocational graduates, to post-secondary education is inhibited by the lack of national secondary school leaving exams, the current university entrance exam, and the inappropriate curriculums of secondary vocational schools. Lateral movement between different types of secondary schools also is limited by the structure of the different curriculums. The ability to recognize nonformal and informal learning in The formal education sector, hindered by a lack of procedures and national occupational standards and assessments, does not fully recognize nonformal and informal learning. Finally, the quality of distance learning in tertiary education also has been questioned.

Reform entry requirements of tertiary education

Consideration should be give to creating a national secondary school leaving exam that would provide a comprehensive evaluation of school achievements. This would replace the short arbitrary university entrance exam, which distorts the functioning of upper secondary schooling and has created a market for high-cost private tutoring, with the

related inequities for poor families. As noted previously, Parliament must quickly approve the pending legislation that would set in place occupational standards and assessments that would in turn facilitate the recognition of formal and nonformal learning.

Expand distance learning

Turkey has a clear need for the expansion and improvement of its distance learning program, which has the advantages of low cost and a broad reach. Anadolu University has an extensive distance learning that has a unit cost of some US\$100—one-tenth of the average cost of an on-campus program. The potential to expand this and similar programs is undoubted, and as such distance learning represents a clear opportunity for Turkey to expand its higher education provision significantly and in a cost-effective way. The universities potentially all could work with Anadolu University to develop a national distance learning program following the Irish model (see Box 4).

Box 4. Irish Distance Learning

The Irish National Distance Education Center is located at Dublin City University. When the university decided to develop a Humanities bachelor degree program it decided to try to involve Ireland's other universities in the program. This proposal was accepted and program and subject development teams were assembled that brought together representatives from each of the universities. The combined program was submitted to the seven academic councils and was approved by them without modification. The National Distance Education Center coordinates the administration of the program. Students are able to choose the university with which they wish to register and from which they receive their degree. Some 15 percent of the tuition fee is allocated to the university with which the student is registered; he or she is issued a student card and accorded the full rights of student membership.

Refine quality assurance systems

The EU Barcelona Agreement requires that Turkey quickly implement the planned quality assurance system and put in place, for both state and foundation universities, an effective institutional accreditation system based on best international practice. A number of universities already have international recognition and stature, and the Middle East Technical University Quality Assurance program provides an excellent means of addressing this issue, taken as is or used as a starting point for another program. The quality of education and research at the university is monitored at both university and faculty administration levels, using multiple tools. Many of these tools provide internal rather than external input, but several of the methods used could be extended to other universities. Student evaluation questionnaires, for example, which

are completed by the students on each course at the end of each semester, are taken into consideration for promotions and awards. Faculty performance assessment questionnaires are similarly completed by the faculty to indicate their education, research, and administrative performance. The criteria for promotion are devised by the university administrative board.

5.4 CONCLUSIONS

The human development sector is multi-faceted and includes a broad range of policies and programs for different populations (that is, young people and adults) and different settings (initial as well as continuing education). All aspects of human development need to be addressed if Turkey is to develop a dynamic labor force capable of realizing the lifelong learning that is essential for the emerging knowledge economy. The following priorities should be considered:

- *Skills and competencies.* Turkey urgently needs to address several issues, all of which have direct relevance in ensuring that learning systems provide the skills needed for the knowledge economy. The government faces three immediate needs: (a) to pass draft legislation and complete the implementation of a comprehensive system for defining occupational standards and assessments; (b) to complete the planned reforms of secondary education, and in particular to refine secondary vocational education, broadening general education programs and moving the more specialized programs to tertiary institutions; and (c) to increase its participation in international assessments such as PISA and ALL, so that it might benchmark its human development capabilities against those of other countries.
- *Governance and administration.* A major priority of the government should be to reform the governance of tertiary education to increase the linkages between education and business. This reform should include a review of the membership of governing boards and of the methods by which chief officers are selected, and should involve also the creation of program-specific advisory boards.
- *Financing, access, and equity.* The government should examine all options and incentives that have the potential to increase participation in secondary education, tertiary education, and adult continuing education. Enrollment is low by international standards. The role of public and private financing should be examined, with a view to identifying how enrollment and access can be improved while maintaining equity and affordability for the poor. There are particular needs to create incentives to stimulate skill development by SMEs, to improve their productivity and support the knowledge economy, and to stimulate the supply by private and public service providers of high-priority training services.
- *Mobility.* Turkey must improve the cross-program and cross-institution recognition of training and educational qualifications (including also the recognition of foreign

qualifications, in accordance with the EU Barcelona Agreement). There is at present little recognition of such qualifications within the formal education sector or between the formal and nonformal education and training sectors, and this is a serious impediment to the mobility of both labor and students. The institution of national occupational standards will help address this problem, as would the replacement of university entrance exams by a national secondary school leaving exam. Distance learning programs also should be expanded, and tertiary education quality assurance systems need to be refined in keeping with international norms.

- *Research and technology.* There is a need to review the incentives for and the structure of financing of R&D in tertiary education. The means of disseminating R&D findings also are in need of improvement, and stronger linkages are needed between tertiary and business institutions (achievable perhaps in the form of business clusters or incubators).

6 INFORMATION AND COMMUNICATION TECHNOLOGIES FOR THE KNOWLEDGE ECONOMY

6.1 TRENDS AND ISSUES

Information and communication technologies (ICT) are a significant component of the knowledge economy, and can be its toolkit in innovation, education, knowledge creation, and relations with government, civil society, and business. The OECD 2000 Policy Brief states:²⁵

Scientific advances and technological change are important drivers of recent economic performance. The ability to create, distribute, and exploit knowledge has become a major source of competitive advantage, wealth creation, and improvements in the quality of life. Some of the main features of this transformation are the growing impact of information and communications technologies (ICT) on the economy and on society; the rapid application of recent scientific advances in new products and processes; a high rate of innovation across OECD countries; a shift to more knowledge-intensive industries and services; and rising skill requirements.

The state of development of the ICT sector in Turkey is mixed. The key features are as follows:

- Investment by Turk Telekom has declined from above the OECD average to below the OECD average, a consequence of the corporation being a state-owned enterprise during a period of economic instability and in anticipation of its privatization. It now stands at the lowest level of OECD countries in terms of its proportion of revenues per capita and per access path.
- Fixed-line penetration in Turkey is below the EU average²⁶, but at 30 percent penetration compares well with that of other accession countries (5th among the EU candidates). The mobile sector has outperformed the fixed sector.
- There are substantial variations in regional fixed-line penetration rates. Eastern and southeastern Anatolia have less than 50 percent of the penetration rates of the Marmara and Aegean regions.²⁷

²⁵ OECD, "Policy Brief: Science, Technology and Innovation in the New Economy." (2000, Paris : OECD).

²⁶ Turkey fixed-line penetration looks better if larger than in the EU size of the households is taken into account.

²⁷ Data provided by Turk Telekom and the Telecommunications Authority.

- Internet charges (using purchasing power parity, PPP) are among the lowest of the OECD countries. Paradoxically, Internet usage is also among the lowest. The charges for leased lines, a basic input for Internet service providers (ISP) and large individual corporate users, are around the OECD average (not PPP). There are few Internet hosts, Websites, or secure servers in Turkey. E-commerce has a low profile and broadband access started to pickup only in late 2003 when 60 thousand ports became operational and preparations for additional 200 thousand have been underway. Internet usage is limited by the price of computers and the level of computer literacy.
- Telecommunications tariff baskets for business and residential customers are high compared to those of other OECD countries, in both nominal and PPP measures. Business and residential access and local call charges are low in comparison to those of other accession countries and the EU. Long-distance and international call charges are high in comparison to EU averages.
- Revenue per employee at Turk Telekom is low in comparison to that of similar companies in OECD countries.
- Productivity in the mobile sector, as measured by lines per employee, is high compared to that in other OECD countries, but revenues per employee is lower than for any other country.
- In terms of “readiness for the e-economy” Turkey is ranked 50 of 82 countries by the World Economic Forum and 72 of 132 countries by the United Nations Conference on Trade and Development (UNCTAD).
- Turkey has substantial, though cyclical, ICT production. It is particularly strong in consumer equipment such as television sets, but overall imports far more than it produces.

The ICT sector in Turkey provides many surprises and paradoxes. For example:

- In the OECD countries, on average, the role of ICT in the national economy increased from 2 percent of GDP in 1990 to 3.35 percent of GDP in 2001. In relative terms, Turkey outstripped this rate. In 1990 telecommunications revenues were 1.37 percent of GDP; by 2001 they had risen to 3.98 percent of GDP. However, using current exchange rates the OECD data indicate that Turkey’s GDP in 2001 was lower than in 1990, while that of the OECD as a whole rose between the reference points. The data thus overstate the importance of the sector, notwithstanding its growth.
- In the broader OECD and historical context, increasing competition in telecommunications services has stimulated an expansion of access, both fixed and mobile; investment; and revenue.²⁸ The pick-up is most noticeable in the early

²⁸ OECD, “Communications Outlook” (2003, Paris : OED).

1990s, when liberalization became more general and competition in the mobile markets intensified. Across the OECD the ICT sector accounts on average for slightly more than 8 percent of GDP, compared to Turkey's 6 percent of GDP. It should be noted, however, that Turkey's ICT sector is dominated by telecommunications, with hardware, "other ICT," and software revenues in particular playing a junior role.

- A recent study by the World Bank listed the "top 10" projects involving private participation in infrastructure for 1990–2001 for the Europe and Central Asia region. Turkey held four of these 10 positions, two in the form of telecommunication projects.²⁹
- The latest OECD "Communications Outlook" report demonstrates that, measured in terms of subscribers per employee, the mobile communications sector in Turkey is one of the most efficient in the OECD.³⁰ The reported figure for Turkey is about three times the OECD and twice the EU average, and is surpassed only by those for Korea and Japan. Revenue per employee in the Turkish mobile sector is however the lowest in the OECD, at around 25 percent of the OECD average.

In general, weaknesses in the ICT environment are the result mostly of restrictions that limit supply and raise costs. The sector is characterized by intense competition, which at its best drives down prices, promotes innovation, and widens the range of choice for the consumer. To achieve this situation requires the active application of competition policy across ICT activities, however, as the relatively low level of competition, as demonstrated in Turkey competing with the EU countries, gives rise to restrictions. Certain actions by government, for example regarding the tax treatment of ICT, also can restrict the market potential of the ICT sector. The usage, diffusion, and production of ICT equipment in Turkey as a consequence has not achieved its full potential.

6.2 POLICY RECOMMENDATIONS

The Turkish government has implemented certain policy actions to improve this state of affairs. These actions include the following:

- The expiry of the exclusive rights of Turk Telekom in 2004 will create an opportunity for new private investors and owners of electronic communications networks to contribute to the overall supply of ICT infrastructure. This should raise levels of competition. So far the first few months of liberalization produced quite

²⁹ World Bank, "Private Participation in Infrastructure: Trends in Developing Countries 1990–2001" (2003, Washington, D.C.: World Bank).

³⁰ OECD, "Communications Outlook" (2003, Paris: OECD).

strong results - 7 licenses for data communication have been issued and 132 new operators and service providers have been authorized.

- The privatization of Turk Telekom will permit the company to make commercial decisions, where in the past it was obliged to follow the directions of government agencies.
- Regulations are being adopted to introduce a EU compliant regulatory package on electronic communications.
- Laws have been introduced to bring Turkey into compliance with the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (and thereby to achieve the removal of Turkey from the United States' Special 301 Priority Watch List). The government also has been conducting antipiracy campaigns.
- A Basic Education Project has been introduced to improve computer literacy in schools. There is an agreement between the Ministry of Education and Turk Telecom to equip 42 thousand schools with ADSL connection by the end 2005.

Much however remains to be done. The strengthening of the following key policies can help bridge the gaps described above.

6.2.1 Remove Restrictions of Entry

Prior to the 1 January 2004 expiry of Turk Telecom's exclusive rights agreement, Turkey retained the only remaining monopoly on fixed telephony services in the OECD, the EU, and the EU accession countries. Prior to this date also, Turkey had to rely on a single source of investment in fixed information infrastructure. The government remains cautious about fully opening up the market, and has imposed a 49 percent foreign ownership limit on concessions in telecommunications in Turkey. The concessions are signed with the operators if the service in question requires a nationwide provision and a limited number of operators because of scarce resource assignment as in GSM etc. Reducing some of the FDI barriers (such as screening and notification procedures, and management and operational restrictions, including restrictions on the employment of foreign nationals) would enable the creation of a more open environment for both FDI and domestic investment, however. If the ICT sector is to deliver to its maximum potential, new entrants should be given the freedom to provide a full range of services and infrastructure. Liberalization must be full³¹ and effective, but as yet the absence of policy guidance and leadership means there has been little movement in the market. The early legislative adoption of an EU-compliant regulatory package on electronic

³¹ Meaning that there will be no restrictions on the number of new entrants except where there are natural resources constraints; for example, on the availability of radio spectrum.

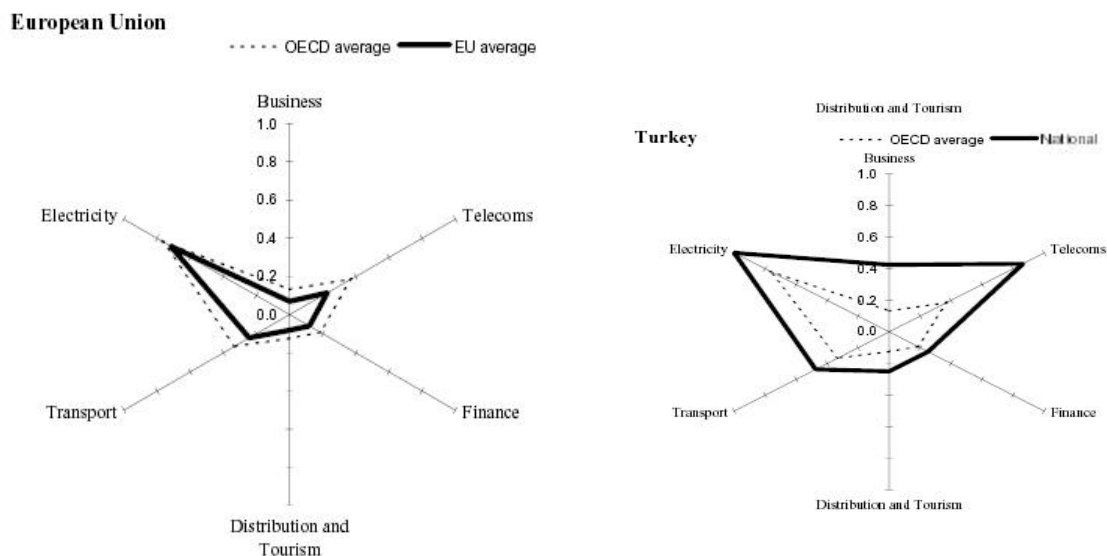
communications would greatly assist the process—that said, the process should not be delayed until the adoption of such a package.

A thorough audit of all other restrictions on trade and investment in ICT, including restrictions on foreign ownership and related restraints, should be undertaken at an early date. The audit should also analyze any revenue-sharing arrangements (for example between Turk Telekom and cable television operators) that may restrict trade on the domestic market (this is a competition policy issue). In all instances the costs to the government of policing the restraints should be taken into account. All restrictions that cannot be justified, taking into account their costs and benefits and the interests of consumers, should be removed.

6.2.2 Encourage FDI in ICT

Restrictions on FDI are stronger in all sectors in Turkey than they are for the EU as a whole. The biggest difference is in telecommunications (see Figure 3).

Figure 3. Cross-Sectoral Patterns of FDI Restrictions (1998–2000)



The restrictions on foreign investment in Turkey places a greater burden on domestic capital to fulfill the demand for electronic communications networks. This impacts the national economy generally. For example, foreign investor is permitted only to match domestic investment in paid-in capital, which unnecessarily weakens the property and corporate rights of foreign investors when alternative ways of financing are used (e.g. debt financing). Self-imposed restrictions in supply furthermore limit the diffusion of ICT throughout the economy and the potential gains in microeconomic competitiveness, productivity, and total factor productivity (TFP). Restrictions on entry, such as the granting of exclusive rights, on ownership, and on foreign entry also influence the prices charged by telecommunications operators, by providing

opportunities for rent seeking and for price inflation. The reduction of some of these restrictions would help Turkey’s progress toward EU accession, allow a broader diffusion of ICT in the Turkish business environment, and enhance growth and competitiveness in global markets.

Table 8 indicates the order of magnitude of domestic and foreign price effects—that is, how much higher prices are due to the FDI restrictions in the telecommunications market. (The price effect for the EU countries omitted from the table is either 0 percent or 1 percent.)

Table 8. Price Effect of Trade Restrictions in the Telecommunications Sector

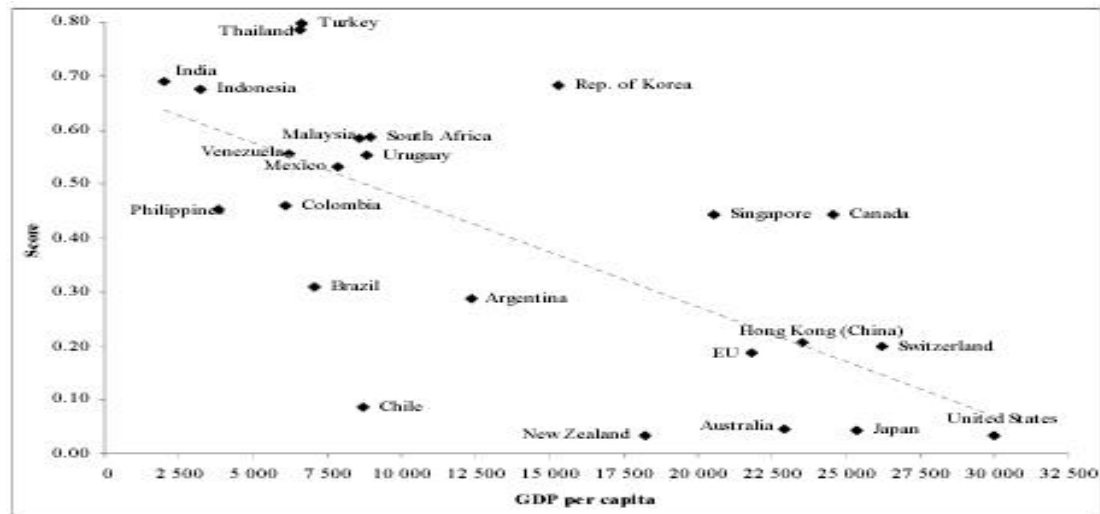
Country	Domestic Price Effect (%)	Foreign Price Effect (%)
Greece	3	6
Hungary	6	13
Ireland	1	3
Portugal	4	6
Poland	11	20
Spain	2	4
Turkey	20	34

Source: Warren, T. (2000), “The impact on output of impediments to trade and investment in telecommunications services”, in Findlay, C. and Warren, T. (eds) (2000), *Impediments to Trade in Services: Measurement and Policy Implications*, Routledge, London & New York.

All of the EU member states included in the table retained restrictions in the sector at the time of the study, and as a consequence recorded price effects. The other member states had largely lifted all restrictions and recorded zero or negligible price effects.

There also are wider economic and social consequences to the imposition of restrictions on FDI. Figure 4 demonstrates the linkage between FDI restrictions in the telecommunications sector and GDP per capita.

Figure 4. Index of Trade Restrictiveness in Telecommunications and (PPP) per capita GDP



Source: McGuire, G. (2002), “Trade In Services – market access opportunities and the benefits of liberalization for developing economies”, Policy Issues in International Trade and Commodities Study Series No. 19, UNCTAD, New York.

These restrictions raise prices, limit the impact of ICT cost drivers, and impede the diffusion of ICT even into those sectors that would most benefit from ICT, as the key input of efficient and cost-effect electronic communications networks is not present. The restrictions on FDI in telecommunications reverberate throughout the economy. Equally, it is likely that restriction on FDI in the concessions in the telecommunications sector and its price effect make a substantial contribution to the prevalence of disappointing ICT scores, such as those related to investment levels. Clearly, Turkey needs urgently to assess the costs and benefits of the restrictions that it retains on FDI and must act to resolve this situation. Addressing the issue of restrictions ideally should be a cooperative effort of the telecommunications and competition authorities.

6.2.3 Reduce the Tax and Regulatory Burden on ICT

The tax treatment of the mobile sector seems excessively harsh, and appears to restrict usage of the services. It may be that lower tax rates would encourage more users and thereby produce a higher fiscal yield. If this is so, tax reductions clearly should be introduced.

The high tax and regulatory burden is reflected in high retail prices and depressed demand for ICT products, and for computers in particular (personal computer usage is estimated at just more than four PCs per 100 population). Local production of computers is small, and import requirements and the channels of distribution do little to encourage foreign participation in the sector.

To sell electronic goods in Turkey, the seller must meet the terms of a service agreement. The Turkish importer is the sole responsible party for the fulfillment of this requirement. The number of service points and their geographical spread is dependent upon the nature of the product and the number of sales projected. The seller may choose to set up its own service centers or otherwise may negotiate an agreement with existing centers that may, for example, handle several brands within a network. This arrangement can dampen competition and artificially raise prices. The clear policy implication is that the Competition Authority should undertake an audit of this form of distribution, to ensure that it works in the public interest. If the arrangement is found lacking, urgent remedial action should be taken.

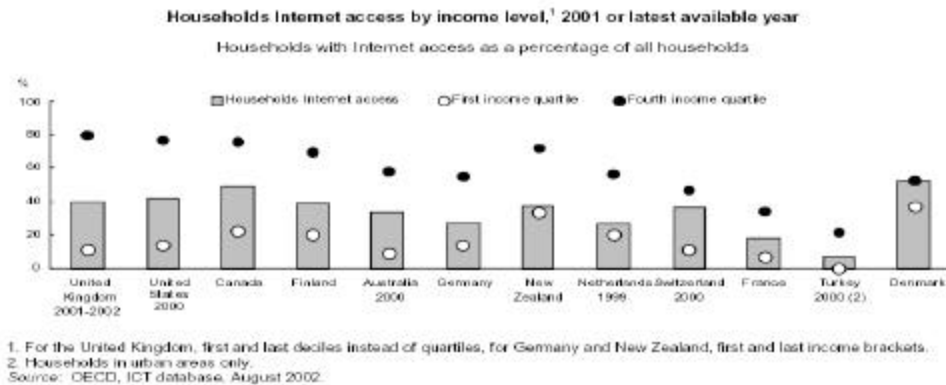
The paradox of the mobile sector—high productivity, yet low revenue per employee—can be explained by the penal rates of tax imposed on operators. Mobile operators have claimed that the state takes 55 percent of customer payments to the operator, and the operator just 45 percent. For prepaid customers, some operators claim the state takes 85 percent of initial customer revenues. Such high rates of effective taxation have the potential to stifle the market, reducing the fiscal contribution of mobile operators to a level well below that which could be expected under a more reasonable taxation regime. Again, there is an evident need for analysis of this situation and for remedial action.

6.2.4 Increase Internet Access and Use

The cost of access to the Internet in Turkey is among the lowest in the OECD, but while there are a large number of licensed ISPs low Internet charges do not translate into high Internet usage. As Figure 5 illustrates, there furthermore is a socioeconomic dimension to this situation: there is little or no Internet usage in the first income quartile, with almost all access concentrated in the fourth quartile. It is likely also that there are significant regional differences in access. There are several contributing factors to this paradox of low cost but low penetration, including the lack of investment in infrastructure in general and the Internet in particular; insufficient competition in the provision of electronic communications networks and ICT products and services; until recently, a limited effort to build demand for the Internet use by introducing e-government services; the low quality of local content; and poor computer literacy. A further inhibiting factor is the price of personal computers (PCs).

Enacting the law on electronic signature is an important step enabling e-commerce and e-services. To enhance e-commerce and improve the competitiveness of the economy, Turkey must increase Internet penetration among the low-income and regional groups where usage is particularly low. It should be possible from here to generate a virtuous circle: as Internet usage takes off, more local content and applications should emerge, and taking up access to the Internet thus should become more attractive to potential users.

Figure 5. Household Internet Access by Income



6.2.5 Strengthen the Dynamics of ICT Production

Turkey has a significant ICT production capability. This capacity is most evident in consumer electronics, particularly the production of television sets, in which the country is among the leading European producers. The second most important subsector is telecommunications equipment.³² Turk Telekom plays a leading role in this area as it traditionally has sourced its equipment domestically, often on a single-source basis for particular types of equipment, using a shallow pool of about 10 suppliers. The prospects of local manufacturers thus are closely tied to the investment decisions of Turk Telekom, and the company's investments have been declining. Turk Telekom also has acted as an export channel, by leveraging its contacts in countries of the Commonwealth of Independent States (CIS), but the worsening telecommunications climate globally may threaten such exports.

These traditional arrangements within the ICT sector are unlikely to prosper in an open, competitive telecommunications market as is required by the terms of EU membership. The government must reexamine the structure of the ICT production sector as it presses toward a knowledge economy.

6.2.6 Strengthen Public and Private Demand for ICT Equipment and Services

The manufacture of PCs and related equipment may represent an opportunity for Turkey to advance its consumer electronics industry. Current production in Turkey takes the form primarily of the assembly of imported components, but the Basic Education Project and a comprehensive e-government implementation strategy seem likely to

³² EU production of radio, TV, and communications equipment stood at €61.2 billion in 2000. Turkey is a comparatively small player in telecommunications manufacturing.

generate new demand for low-cost Internet-compatible terminals. If, while complying with its international commitments to organizations such as the WTO and the EU, Turkey is able to encourage a significant element of competitive domestic supply, the opportunities for ICT production and possible export could be enhanced significantly. Policies to promote ICT usage equally could act as a catalyst to the production of local Internet content and applications. Software producers also could play a major role in creating new jobs and potentially in increasing exports. To realize the full benefits of these opportunities the government must however maintain a tightly coordinated interagency approach, to the situation, and must give its own leadership to the ICT sector and to the knowledge economy generally.

By lifting the restrictions on ICT business, trade, investment, and consumption, the government could stimulate demand for ICT goods and services. Ongoing projects such as the Basic Education Project and e-Transformation Turkey Project also have the potential to boost demand for products such as PCs, software, printers, screens, and storage media and installation and maintenance services. Within the context of Turkey's international commitments it should be possible to promote also domestic supply. Lifting restrictions on the ICT sector would promote ICT production capability, for example; a credible policy statement on e-government, backed by the early release of basic procurement specifications, also would be important to give domestic suppliers sufficient time to prepare designs and estimate costs. It is possible that EU-style structural funds could be applied to these activities.

6.2.7 Update the ICT Legal and Institutional Environment

The most important ICT regulatory institutions are as follows:

- The Communications Supreme Board provides policy guidance to the Ministry of Transport (the MOT, which is responsible for overall telecommunications policy), largely on matters related to radio communications.
- The Telecommunications Authority was established in 2000 as the first independent, sector-specific regulator in Turkey. The licensing functions of the MOT were handed over to the authority in 2001. The responsibilities of the authority generally are similar to those of its counterparts in the EU—addressing, for example, interconnection, tariffs, and licensing conditions—but there are key differences. As described by the OECD.³³

“The authority’s responsibilities are in some ways broader than its counterparts in other OECD countries. In particular, it is authorized by law to take measures to protect national security, public order, or public services as necessary. A regulator having such powers is unique in OECD countries. The exercise of such discretionary power can be highly political and is generally seen as the responsibility of elected authorities

³³ OECD, “Turkey: Crucial Support for Economic Recovery” (2002, Paris :OECD).

rather than an independent regulator. This mandate is too broad and should be reconsidered.”

- The Competition Authority, established in 1997 following the adoption of the Competition Act in 1994, is responsible for competition issues in all sectors. About one-fourth of its staff specialize in ICT. The authority recently fined two mobile operators over the issue of national roaming.

The Competition Authority benefits from having a fairly recent Competition Law within which to work, but the Telecommunications Authority has to work with a much amended and cumbersome Telecommunications Law that dates from the 1930s. With the forthcoming liberalization of the telecom market and EU accession there is an urgent need to adopt a new EU-compliant e-communications regulatory package.³⁴ The new law should be enacted as soon as possible, as the cost drivers and other benefits of ICT are essential for the future growth of the economy. (There is no need to tie the introduction of the law to the accession timetable.)

In addition to the generality of instruments required by the EU package, including the streamlined licensing procedures, the law will have to:

- address the issues of universal service and access (see also Annex 1) in an innovative and competitively neutral manner, given that the level of access in Turkey is significantly different from that in the EU;
- address the financing of the Telecommunication Authority and remove the Authority from the role of a tax collecting machine; and
- convert the current voluntary consultative process into a mandatory process, to permit greater flexibility in staff recruitment in the context of the administrative court system and to guard against tactical or other blocking appeals against the decisions of the Telecommunication Authority.

6.3 CONCLUSIONS

The full and effective implementation of the e-Europe+ program, of which Turkey is a member, will advance ICT and enhance the global competitiveness of the sector. The introduction of competition policy additionally will inject new dynamism into the sector. For maximum effect these reform efforts should be undertaken with tight interagency coordination and linked to a comprehensive e-government implementation strategy. Such a strategy furthermore would be beneficial also to the ICT production sector. To effectively promote the diffusion and growth of ICT through the Turkish

³⁴ See http://europa.eu.int/eur-lex/en/archive/2002/1_10820020424en.html

economy the sector finally will require also a new, EU-compatible electronic communications law and its full and effective implementation.

7 BUSINESS ENVIRONMENT AND THE KNOWLEDGE ECONOMY

7.1 TRENDS AND ISSUES

For its knowledge economy to thrive, a country must have a business-friendly environment—that is, a proper mix of regulations, implementation practices, incentives, and institutions. To a large extent this is a standard backdrop for any type of business to succeed; some requirements are, however, specific to a knowledge-based economy. First of all, a higher level of risk of investment in new products, new markets, and new technologies must be mitigated by more stable and predictable parameters of business making. An increase in the level of knowledge inputs used to develop products and technologies additionally requires a higher level of legal protection of intangible and other assets, through intellectual property rights. A knowledge monopoly, however, even if temporary, has to be mitigated by regulations protecting consumer rights (for example, a second-generation software program should be compatible with the first-generation program). A knowledge economy requires changes in formal and informal regulations and behavioral patterns regarding access to information, social openness, and the role of civil society in policymaking. Finally, the regulatory practices of a traditional economy may be enhanced by knowledge economy-specific additions, such as the use of electronic signature technology or the business valuation of intangible assets. Access to finance requires different tools of risk assessment, monitoring, and accommodation.

Turkey, in contrast to the transition economies (including China), has had a functioning market economy for decades. Many market regulations and institutions have developed and matured over time, and the country now must build the administrative capacity to deal with emerging regulatory issues. Transition economies as a result have in some areas managed to proceed faster than Turkey in developing the business environment necessary to attract knowledge-intensive businesses, both local and foreign.³⁵ The deficiencies of the business environment in Turkey furthermore go beyond deficient regulations, and are rather related primarily to the imperfect implementation of these regulations. This in turn is a function of wrong incentives and deficient institutions.

For example, for many years Turkey's foreign investment regulations have been among the most investor-friendly in the world, but FDI levels nonetheless are below the levels of other comparable economies and are well below the potential capacity of the Turkish economy to use FDI. International experience shows that a poor FDI flow is closely related furthermore to a poor investment climate for local investors. The introduction of proper regulatory incentives and institutions for the knowledge

³⁵ For example, Romania, in its bid for the EU accession, introduced a full-fledged e-procurement system.

economy will depend on a broad spectrum of macroeconomic, fiscal, and social issues. In this sense, recommending a regulatory environment conducive to the development of the knowledge economy is a task well beyond the scope of this study. The remainder of this section therefore focuses on the incentives and institutions that render the business environment unfriendly to the knowledge economy, rather than attempting to propose policy recommendations.³⁶ In particular it focuses on the consequences of macroeconomic volatility, inefficient public governance, and weak participatory policymaking.

7.2 MACROECONOMIC VOLATILITY AND THE KNOWLEDGE ECONOMY

Despite the country's achievements of the past two decades, Turkey's economy has operated under a cloud of vulnerability, plagued by fiscal imbalances, chronically high inflation, and sharp swings in the business cycle. Early attempts to stabilize the economy fell short, and high growth has never been sustained for long. Inflation was higher and growth was lower, on average, in the 1990s than in the 1980s. The return of growth after the last crisis has yet to be confirmed by structural changes in the economy and in public governance. Macroeconomic volatility has negatively influenced the development of innovative industries in three ways, through:

- insufficient demand for knowledge-intensive products;
- the crowding-out of investment from the productive sector as a consequence of the demand for financing from the public sector; and
- a lack of the stable parameters necessary for long-term business planning.

7.2.1 Insufficient Demand for Knowledge-Intensive Products

Macroeconomic volatility and a recurrent boom–bust cycle have held back the development of innovative industries by undermining household disposable incomes and thus limiting the amount of money available for the purchase of nonbasic goods and services. In the industrialized countries the consumer demand for knowledge-intensive products and services comes mostly from the broad middle class. Computers and software, mobile phones, new pharmaceuticals, entertainment, banking services, and paid education require a broad base of consumers who can afford new products and services, with a disposable income (after satisfying basic needs) of at least a few thousand dollars a year. Turkey has yet to develop this part of the social strata. According to a survey

³⁶ The most recent comprehensive assessments and recommendations are World Bank, “Turkey: Greater Prosperity with Social Justice” (2002, Washington, D.C.: World Bank); and World Bank, *Turkey, Country Economic Memorandum* (2003, Washington, D.C.: World Bank).

carried out in 2000, approximately 15 percent of the population was identified as middle class consumers.³⁷ The 2001 crisis undercut this nascent middle class, such that relatively few people can afford high-end imported goods. Most people in contrast are preoccupied with the basic daily needs of food, shelter, and transportation. Most of the new products that have a high knowledge content, such as laptops, mobile phones, and electronic consumer goods, furthermore are within an international context relatively expensive. The prohibitive prices of these products are due in large part to high taxes and customs duty, which in turn reflect a high popular demand for protectionist policies.

The demand for knowledge-intensive products and services nonetheless is fairly steady, driven in large part by public procurement. This fact is of particular importance for SMEs in the high-tech sectors, which, thanks to state orders, are eligible for project-based long-term financing—despite often having a short business track record and insufficient collateral. Turkey has a higher level of public procurement than do other OECD countries, but the practices of public procurement are far from perfect, and do little to enhance competition or drive the development of innovative technologies. Political contacts and corruption too often substitute for entrepreneurial skills. A recently adopted procurement law that aims to overhaul the deficiencies of public procurement hopefully will lead to better and more transparent procedures; it will however require more time and effort before practical solutions can make these improved rules work for the good of Turkish innovative businesses. In this regard, the introduction of transparent, broadly accessible online e-procurement is critical.

Turkey additionally faces a medium-term dilemma of needing to exercise fiscal discipline for sustainable growth while implementing business-stimulating policies. A sustainable and sound pattern of growth requires a tight fiscal policy, but fiscal austerity (at least in the short run) can limit private and public demand for many goods and services—and especially those with a high knowledge content—and therefore can weaken what could be a major stimulus for business.

7.2.2 Crowding Out the Productive Sector

The crowding-out of the productive sector, in the same way as does corruption and inflationary taxation, adds to the fiscal burden. The result is a high cost of capital. All three factors have been consistently present for decades in Turkey, to the detriment of the private sector.

³⁷ World Bank, “Turkey: Greater Prosperity with Social Justice“ (2002, Washington, D.C.: World Bank).

Box 5. Entrepreneurial Challenges in Turkey: A Case Study of a Small Knowledge Economy Company

The release of the EU Adaptation Package No. 6 in July 2003 made start-up of a new company in Turkey as easy to do as anywhere in the world—at least in theory. In practice, start-up entrepreneurs continue to face major challenges. The following case study, adapted from an interview with the entrepreneurs involved, seeks to illustrate these challenges.

In August 1999, two designers set up a small graphic design and advertising company in Ankara. Neither of the designers had previous business experience, nor did they have any financial backing. The company's only major assets were two computers, valued new at US\$2,500 each. They applied for a bank loan that had been set up specifically for new entrepreneurs, and which was granted in a sum of slightly less than US\$2,000, fixed in Turkish lira. The company had to pay the loan back in three years, at a interest rate significantly less than the prevailing market rates. The terms of the loan required that the company declare as collateral real estate registered in the name of one of the founders. Absent any such property, the bank agreed to make the loan available if three state employees also signed the agreement. For the first 18 months the company successfully paid back its debt installments. The February 2001 economic crisis saw the bank add 300 percent interest to the balance of the loan, however, obliging the company to sell its computer equipment to pay off the debt.

The company had been obliged to pay tax from its inauguration, and even before bringing in any revenue. One fixed tax that had to be paid immediately was based on the company's potential earnings for its first six months of business. The company ultimately spent 58 percent of its earnings on 11 different taxes—the system imposed so many taxes, in fact, that even the accountant missed some of the deadlines, incurring additional penalties against the company.

In August 2001 the founders decided to stop operations. It took a further 12 months for the firm to be officially shut down and the founders paid taxes for another five months before finally clearing their debts. The founders, far from being identified and respected as entrepreneurs, socially were perceived as failures.

Fiscal burden

Turkey's corporate tax system is highly complicated.³⁸ Tax practices are not conducive to the growth of small and medium-size firms. In particular, SME start-ups

³⁸ World Bank, "Turkey: A Diagnostic Study of the Foreign Investment Environment" (2001, Washington, D.C. FIAS)

in nontraditional lines of business face the disadvantages of a high cost burden of tax management and unfair competition from nonpayers (see Box 5).

The tax system offers a generous menu of tax shields, such as tax holidays in free trade zones, investment tax allowances, and tax exemptions in technology parks. In theory all firms, irrespective of their size, can enjoy these privileges. In practice, however, SMEs have limited opportunities to apply for tax exemptions due to the high costs of tax management. The maze of bureaucratic requirements, combined with the informal costs of lobbying, mean that most tax privileges end up being granted to large, well-established firms, thus weakening rather than supporting the competitive position of small start-up firms. Perhaps even more burdensome is the unfair price competition in which the firms that avoid paying taxes can engage.

There additionally is a widespread problem of tax avoidance: It is well-known that products and services delivered without an invoice are about 30 percent cheaper than those that come with an invoice. The cases of tax avoidance are not limited to small firms operating in informal markets, but first and foremost are committed by registered, large companies underreporting part of their earnings. The tax system is lenient on nonpayers, despite this: tax amnesties come along so routinely with a change of government that it makes better business sense to withhold taxes, to wait for the forgiveness of liabilities, and to pay the penalties associated with nonpayment of taxes rather than to pay taxes on time. Since 1963 there have been 10 tax amnesties.

Corruption also places an arbitrary and disproportionate burden on start-up businesses. Corruption is perceived to be one of Turkey's gravest problems, behind only inflation and unemployment. Institutions with perceived corruption problems include customs, the traffic police, and the land registry. Finally, political connections also are an important factor for business. Many companies report that political connections are essential for doing business, indicating a high level of state capture in Turkey.³⁹

Inflationary taxation

A whole generation of Turkish businesses have operated under conditions of two-digit inflation. High inflation harms business in many ways, from its consequences of negative demand to supply-side cost consequences. The latter is particularly significant for businesses that have long production cycles, which typically includes businesses that have a significant R&D component.

Cost of capital

Turkish businesses, particularly those new lines of business that have a long gestation period, identify high and unpredictable inflation and the high costs of capital (real interest rates) as the main detrimental factors to doing business. Real interest rates, which are too high for most business activities, are the most obvious but not the only

³⁹ World Bank, "Turkey: Greater Prosperity with Social Justice" (2002, Washington, D.C.: World Bank).

negative consequence of high public borrowing. Turkish commercial banks make much of their profits from investing in the public debt or the quasi-public debt of state enterprises, rather than competing for business clients. Financial institutions also have become less inclined to take on the risk associated with private ventures, are less innovative in offering new financial products, and generally have had little incentive to look for new and niche business opportunities.

Paradoxically, the lack of a competitive environment has made banks more likely to succumb to the moral hazard of reckless lending to unsustainable business, in the expectation that the government will bail them out in the event of the failure of the borrower. This behavior has seen in recent years some US\$17 billion of public money provided to meet the obligations of troubled private banks, with only a tiny fraction of this sum recovered from their profligate owners. Public money, in the sum of US\$33 billion, also has been used to cover the missing assets of state-owned banks. This “unholy alliance” that has existed between some bankers and their borrowers has had a detrimental effect on the quality and decisiveness of the bank supervision system. The banking sector still suffers from overreliance on income from government bonds, a volatile operating environment, and issues of credit quality, with the result that its ability to make loans to new entrepreneurs, whether or not their ventures appear sound, has been seriously curtailed.

Lack of stable parameters for long-term business planning

Many emerging market countries have experienced large fluctuations in either growth or the real exchange rate, but Turkey has experienced instability in both dimensions. The country has suffered from a boom–bust cycle that has continued into the new decade, with 6 percent growth in 2000 followed by a record contraction of more than 9 percent in 2001. Strong growth returned in 2002–03. High and unpredictable inflation and exchange rates are particularly harmful for businesses that have a long gestation period for new products and technologies. Businesses as a consequence tend to avoid this type of production, focusing instead on traditional products and technologies and on familiar markets. Those that choose despite this to move into new products, technologies, or markets tend to protect themselves against unexpected inflationary and exchange movements by planning higher profit margins and/or trying to secure for themselves a market position guaranteed by administrative instruments.

7.3 PUBLIC GOVERNANCE AND THE KNOWLEDGE ECONOMY

Good public governance is a necessary condition for good economic performance. This is particularly true in the case of knowledge-intensive enterprises, for which the intrinsically higher risks related to new products, markets, and technologies must be compensated for by stable and predictable policies and regulations. The implementation of these policies and regulations furthermore should be overseen by sound administration and the justice system. Public sector management in Turkey

scores poorly for efficiency in comparison to the OECD average and to many emerging market economies. The distinctions between administration, budgetary units, and state-operated enterprises (SOEs) are blurred. Employees in SOEs enjoy the status of public servants, with all related protections and rigidities. Public sector overemployment is endemic and often is politically motivated, rather than decided on merit. This has given rise to a culture in which the risk-averse public employee is seen as superior to the risk-taking private entrepreneur—a perception that is particularly harmful for the young generation of professionals, who after receiving what may be a first-rate education at a Turkish university are neither willing nor able to risk undertaking their own business venture.⁴⁰

Turkey has a relatively strong legal and regulatory basis from which to address the requirements of increasingly complex economic and commercial relations, but the legal framework, including that specifically for e-commerce and the protection of intellectual property rights, nonetheless requires upgrading as the country faces the economic and commercial challenges of the knowledge economy. Turkey has since 1999 developed the framework necessary to support economic reform and private sector development, passing legislation for social security, banking, telecommunications, agriculture, tax reform, fiscal management, public procurement, and public debt management. It recently has focused on developing amendments to the bankruptcy laws and is revising the Commercial Code. This is an important especially for the development of a sound corporate governance environment.

Implementation of the new legislation, however, is lagging. An effective judiciary is an essential underpinning of investment decisions, especially those that include a high intellectual component. Entrepreneurs are unlikely to invest in the absence of assurance that the legal and institutional framework is adequate to protect and enforce their contractual and property rights, but the process of commercial disputes remaining Turkey is slow. The number of disputes also is increasing, creating a progressive increase in the number of pending cases carried over from one year to the next. Court administration and case load management simply are not effective, in part because of the exercise of political influence and pressure that both challenges the work of judges and regulators and impairs their independence.⁴¹

7.4 PARTICIPATORY POLICYMAKING FOR THE KNOWLEDGE ECONOMY

The knowledge economy requires the engagement of civil society in the design and implementation of economic policies and regulations. In leading countries of the

⁴⁰ This was confirmed by author interviews with young professionals in Turkey.

⁴¹ Only 40 percent of Turkish businessmen perceive the courts as “fair and impartial.” World Bank, “The Business Environment and Enterprise Performance Survey (BEEPS)” (2002, Washington, D.C.: World Bank/European Bank for Reconstruction and Development). Available online at: <http://info.worldbank.org/governance/beeps2002/>

knowledge economy partnerships among government, the private sector, academia, and civil society have proven to be an effective means of mobilizing the dispersed social resources of knowledge, innovativeness, and entrepreneurship. Broad participation is of critical importance in spreading knowledge; the knowledge economy, epitomized by the Internet, simply will not develop without broad public participation, channeled through a functionally organized system that both produces and shares knowledge.

The regulatory system in Turkey for NGOs is complex. There are numerous levels of regulation and monitoring for voluntary organizations at the central level, ranging from the Council of Ministers to the Ministries of Finance and Interior and the line ministries. The General Directorate of Foundations and the Bank for Foundations (Vakifbank) have substantial influence over the functioning of NGOs, and the government often gives priority to “government-organized nongovernmental organizations” (GONGOs) that often are used by government agencies to create extrabudgetary income through the establishment of a revolving fund mechanism. This tactic is frequently used to offset government budgetary controls, by providing direct access to derived incomes ranging from consultancy services at universities to the publication and sale by government ministries of books, brochures, and pamphlets.

Policymaking in Turkey is rooted in a curious mix of radical, top-down reforms with strong state intervention and the vibrant, self-regulatory entrepreneurial behavior of individuals. The interplay between these two elements has never been strong, however, and mostly depends on informal, personalized influence and connections. It is naturally more difficult for small enterprises than large ones to have their voices heard. Despite its relatively long history of operating under a market regime, Turkey has not yet produced sufficient institutional solutions to support public participation in policymaking. Turkish businesses instead have developed a number of strong associations to press the interests of their members, and these are pressuring the government on a wide range of issues, including, for example, the customs union with the EU. The old-style, state-sponsored organizations of business, academia, and R&D institutions have far from been replaced by bottom-up organizations that truly represent the interests of their members, however.

There is a strong tradition of community obligation in Turkish society. Many charities and foundations exist that have been set up by private citizens, and there is a steady flow of funding to such groups. The strengthening of the market economy and recent trends toward democracy, together with the natural and economic crises that have shaken Turkey in recent years, additionally have galvanized NGOs into action and advocacy. The progress of these groups has been encouraging, but the channels of communication and cooperation between the state and the NGOs remain limited. There has been a considerable increase in the government’s willingness to engage with NGOs on some development issues, but in other areas the government is holding back, often through fear of permitting the growth of extremist movements. The traditional skepticism of a strong centralized state has changed to a fear of a strong civil society, and the legal system has as a result been excessively cautious about allowing the

development of NGOs as partners in the policy debate. Participatory decision-making and community-driven development (CDD) are relatively new concepts in Turkey.

7.5 CONCLUSIONS

Unfavorable incentives and institutions are forcing many businesses to operate fully or partly in the informal economy. This obviously is damaging for businesses that play by the rules (that is, that participate in the formal economy and pay their taxes), but those businesses that choose to operate in the informal sector in so doing also are limiting their ability to grow; for example, by disqualifying themselves from bidding for public contracts. In the broader perspective the culture created is one of pursuit of the quick gain, and this clearly is not conducive to long-term business planning nor to the making of investments that is essential for firms active in the knowledge economy.

The cyclical inflation that has persisted in Turkey, the result largely of state support of inefficient industry, has deteriorated, however, and there is promise of a new paradigm that is more in tune with the challenges of the global economy. A new system of institutions and incentives would be much more open to competition and innovation, should produce an even playing field, should enable better and more equitable access to financing, and should permit less state interference. Many Turkish businesses have proven their ability to compete internationally and now see the old paradigm as a liability.

The deficiencies carried forward from the old business environment cannot be easily fixed without substantial, fundamental policy changes. These should include, but not be limited to, measures to resolve: (a) the sharp swings in boom–bust growth rates, employment, and global demand; (b) the persistent fiscal imbalances financed through high-yield public debt; (c) chronically high (two-digit) inflation; (d) high real interest rates that are unaffordable to innovative, high-risk businesses; (e) repeated devaluation of the Turkish lira; (f) weak fiscal discipline; (g) inefficient taxation and a narrow tax base; (h) poor expenditure management; (i) the ambiguous legal status of state enterprises and their staff; (j) the practice of bailing out poor performers; (k) overemployment in the public sector; (l) patronage and corruption; (m) the disenfranchisement of business, academia, and NGOs from policymaking; and (n) the lack of transparency in public procurement.

The structural reforms taking place in Turkey will have a better chance of sustainability if they are built upon improved business conditions for the innovation sector. Better macroeconomic reserves could be generated through greater government efficiency, creation of an environment more conducive to business, faster privatization, and the provision of greater incentives and removal of disincentives for FDI. By creating a stable and sound business environment, including the macroeconomic environment, Turkey can support the growth of the innovation sector and in so doing create a virtuous circle of continued growth.

8 IMPLEMENTING THE KNOWLEDGE ECONOMY AGENDA

8.1 IMPLEMENTATION GUIDELINES

Activities designed to support the development of the knowledge-based economy in Turkey should be coordinated under a single agenda. This Knowledge Economy Agenda (the Agenda) should have at its core the e-Transformation Program that is being prepared by the government's State Planning Organization (SPO), but it should also embrace a number of activities that are being undertaken by different private and private-public stakeholders, individually or as joint efforts.

The findings of this study suggest the following six guidelines for implementing an Agenda in Turkey:

- *Long-term commitment.* Improving Turkey's competitiveness and progressing toward a knowledge-based economy is a process that will need time. This implies a long-term commitment on the part of the authorities and decision-makers in Turkey, but also on the part of the business and academic communities. Moving the knowledge economy agenda forward in Turkey is likely to require a series of activities embedded into a longer-term Agenda of about 10 years, starting with a few targeted interventions and subsequently moving on to address increasingly sophisticated challenges.
- *Precedence of policy issues.* Expanding the knowledge economy frontier in Turkey will require first of all that specific policy issues be addressed, as reflected in this study and raised by numerous Turkish stakeholders. Investment programs in support of the knowledge economy have to be meaningfully complemented by specific policy reform activities.
- *European integration.* The Agenda must support Turkey's bid for membership of the European Union. The agenda needs to support Turkey's efforts conform with the requirements of the Lisbon Strategy, the European Research Area, the e-Europe 2005 Action Plan, the Barcelona Agreement on educational standards, and other major European initiatives. More broadly, it should result in "the capacity to cope with competitive pressure and market forces within the Union" (EU Copenhagen criteria).
- *Building on achievements.* It is important that Turkey build on the accomplishments it has made to date as it moves toward a knowledge-based economy. This will require (a) replicating and scaling up the best practices of internationally successful Turkish firms and sectors of the economy; (b) replicating previous successful efforts at establishing key institutions in support of innovation policies; (c)

strengthening basic and secondary education; and (d) promoting ICT and e-development.

- *Public–private partnerships.* Cooperation between government agencies, business, NGOs, local communities, and academia should be at the core of the knowledge economy agenda. Experience shows that bringing together people, enterprises, and institutions can be the best way to address policy problems. Achieving this level of cooperation in Turkey will require first that certain problems and barriers first be overcome.
- *Decentralization.* Some of the activities of the Agenda are likely to be implemented at the regional or local levels. Resource constraints mean that the best way forward may be for some regions to pilot the agenda on the basis of agreed criteria, possibly also introducing some competitive approaches and taking into consideration social priorities.

8.2 BUILDING BLOCKS

The Agenda builds on the four-pillar knowledge economy assessment, but its objective is to identify and prioritize those activities likely to have the greatest impact in advancing the knowledge economy. The Agenda also must take into account the institutional feasibility of different activities, given the available resources. The Agenda should contribute to the improvement of the competitiveness of the Turkish economy and enterprises by (a) connecting enterprises with sources of knowledge within Turkey and abroad (that is, creating innovation chains); (b) enhancing human capital to meet the requirements of the knowledge economy; (c) providing infrastructure for an information society; and (d) strengthening the regulatory and economic environment to enable knowledge-based initiatives to develop.

8.2.1 Support to Innovation Networks

The development and implementation of innovation policy has been advancing steadily in Turkey over the last decade, helping create a more supportive climate for innovative initiatives in the enterprise sector and supporting capacity-building at the level of government institutions and related agencies, universities, and businesses. A more comprehensive innovation program needs now to be pursued, as discussed in this study. The Agenda should put the enterprise sector—in particular small and medium-size start-ups in the new business areas and the entrepreneurs behind them—at center stage of the innovation effort. The Agenda should build and expand on the experience accumulated by institutions such as TUBITAK and the TTGV that support innovation.

The Agenda should support the scaling-up of all activities that have been successful in promoting innovation, including those promulgated by TUBITAK, the TTGV, and others. This will require a review of the current practices of these institutions (some of the institutions are already undertaking such a review) to ensure the relevance and efficiency of their programs. The scaling-up of the successful activities such as TTGV, for example, could entail a decentralized expansion of its technology development financing program, venture capital funds, technology support services, start-up capital funds, and innovation centers. This could be achieved by way of “franchising” the TTGV experience to decentralized networks of private and public-private providers.

The Agenda also should support the diffusion of the best experience of university-industry research centers in responding to specific business needs, following the approach, for example, of those centers currently operating in support of the ceramics, textiles, and other sectors. These new centers could follow the existing model, with partial subsidy from TUBITAK, and could be established on the premises of a university that has strong competences in a related field. The steering board of the center should include a majority of businesspersons. Biotechnology-related industries such as health and agriculture, and ICT industries in particular could benefit from the development of such research structures.

In more general terms, the existing systemic solutions in the innovation system – linear by their nature – should be transformed into multidimensional network solutions. Internet-based “virtual space” networks connecting involved agencies and businesses provides the most efficient way to built synergies and disseminate knowledge generated in the networks.

8.2.2 Developing Skills for the Knowledge Economy

One of the fundamental objectives of Turkey’s knowledge economy agenda should be to develop, through both initial training and continuous skills upgrading, a society of skilled, flexible, and creative citizens. Ensuring that disadvantaged groups participate in the knowledge economy is a central concern, on grounds of equity but also to ensure that none of the innovative and creative potential of Turkey’s citizens is lost.

The Agenda should stimulate demand from employers, particularly SMEs, for workers trained and prepared for the knowledge economy, and also should stimulate the supply of learning opportunities by NGOs and public and private institutions and enterprises. This public intervention should catalyze growth of the knowledge economy by injecting knowledge workers, producers, entrepreneurs, consumers, and informed citizens into a growing information society, equipped with a new e-infrastructure and operating in a policy and regulatory environment that promotes the growth of the

knowledge economy. It would need to be supported by a public awareness campaign.⁴²

Market-based mechanisms should be used to stimulate demand for and the supply of knowledge economy skills, but these should be supported by public–private initiatives wherever necessary and wherever positive international experience exists. On the demand side this would entail creating incentives for citizens, especially young people who are already working in SMEs or are unemployed, to learn knowledge economy skills and to apply these skills by entering the job market, by establishing their own business, or by accessing employment opportunities within Turkey and elsewhere in the world in on-line services. A skills development public financial support program, financing tuition fees and perhaps stipends, could be introduced to assist citizens through the necessary skills training courses.

On the supply side, incentives should be created to encourage suppliers (especially private sector suppliers, but also public sector training service providers such as universities, post-secondary technician training colleges, and NGOs) to develop flexible, modular, competency-based training content. Incentive financing should be provided to cover the start-up costs of skills training programs and to market them to trainees funded on the demand side. New providers of the knowledge economy skills would add to the innovation networks suggested above.

8.2.3 Infrastructure for Development of the Information Society

Expanding ICT access

Further objectives of the Agenda are to expand access to information infrastructure and ICT, support the establishment of a regulatory framework for e-commerce, improve government efficiency and transparency, and develop the ICT skills necessary for full integration into the EU and for the development of the information society. Successful development of the information society would contribute to the overall success of the

⁴² A list of knowledge economy skills supported by the Agenda includes, but is not limited to the following: basic ICT applications such as word processing and spreadsheets; advanced ICT applications such as Web-based Internet research, small business management, Web commerce applications, Web page design, desktop and digital publishing, network setup and server management, videoconference management, database management, and workflow management and control; and specialized software development applications and application development, including for PCs, mobile phones, and handheld devices. Creative areas could include skills related to the production, publishing, and marketing of content, including audio, music, and digital video recording studio management, writing and publishing, and advertising and communications. Technician-level administrative skills include product design, production and inventory control, project management, international trade and marketing, and quality assurance; and technician-level skills for the health care professions and electronic industries. Finally, and importantly, the promotion of learning opportunities to develop entrepreneurship skills for an understanding of how to start up a small business or home business, how to market one's own skills directly and online; and, both within Turkey and abroad via online employment, how to market products.

Agenda. For example, better access to ICT services would improve the ability of private enterprises to participate in innovation networks and to compete for public procurement contracts. It would also potentially provide for new types of job opportunities, employing higher-skilled labor, including among those private and public establishments that provide education and training programs.

The necessary development of the information society however is constrained by the severely limited access of citizens and enterprises to information infrastructure and to ICT. Access to ICT in Turkey is lower than in its competitor countries and there is a marked imbalance in access between urban and rural areas and between one region and another. Liberalization of the electronic communications sector and the anticipated privatization of Turk Telekom should improve access and help close these gaps, but EU and other international experience demonstrates that, if left purely to market forces, some gaps are likely to remain or even deepen.

Public remedies therefore also are needed. A Universal Access Fund (UAF) could be established in accordance with the electronic communications regulatory package of the EU, the draft law on electronic communications currently under consultation in Turkey, and the objectives of the e-Europe 2005 Action Plan. Allocated on a competitive tender basis in compliance with the draft law, this fund could be used to encourage private investment in the provision of ICT access in targeted regions or locations.

Closing the digital divide (that is, providing universal access to ICT) may be achieved through a range of measures, including the provision of: (a) Internet access in libraries and post offices; (b) remote rural telecenters; and (c) multi-purpose hubs serving SMEs, educational establishments, local government, and the public. The different business models that can be drawn on to address the problem would require different allocations from the UAF to fund different potential combinations of applications. These applications clearly would need to be assessed.

Providing access to ICT infrastructure is not an end in itself, but should be linked to the other activities and areas of the knowledge economy agenda. The objective of activities undertaken to improve ICT access should be, through creating an access platform for market-driven service providers, to facilitate the delivery of decentralized services in the fields of education, innovation, e-commerce, e-government, and so forth.

E-government

There are two activities that the government must complete prior to moving forward on the delivery of e-government services. These are an e-readiness assessment and a multi-year investment program, combined with an implementation roadmap. A strategic investment program and implementation roadmap would help establish priorities and phase the investment needs of government-wide applications. The roadmap should also assess the linkages and synergies that can be explored to enable the alignment of

programs with the public administrative reform effort, and should recommend specific activities suitable for public–private partnerships and outsourcing.

Experience shows that two activities in particular have an immediate impact on the transition to e-government: the introduction of e-procurement and development of an e-interface between government and citizens and businesses. The key features of these activities are as follows:

- E-procurement is a strategic application that experience demonstrates can yield up to a 20 percent reduction in annual public procurement budgets. It also supports the increased participation of knowledge-intensive SMEs in public tenders and increases governance and transparency. Subject to appropriate procurement legislation, a pilot e-procurement model could be quickly rolled out in selected agencies that handle a high volume of procurement.
- An e-interface between government and citizens and businesses would put some government services online to alleviate the administrative burden of distributing basic documents and information, and to reduce corruption. The services provided could include the online filing of business registration documents, for example. This would not only assist the participating businesses but, by simplifying business registration and tendering for procurement contracts, would also serve as a catalyst to bring SMEs into the formal economy. Online services for citizens could include submission of applications for pension benefits, the registration of deaths, marriages, and births, and other administrative services. The next step for the e-government agenda could be online payment of taxes.

It should be noted, of course, that the success of any e-procurement program or government–civil society interface over the Internet is entirely dependent on the quality and reach of the national ICT infrastructure.

E-commerce

The Agenda should create the conditions in which e-commerce can develop. Critically, it should address the gaps in the legal environment, particularly in terms of identifying relevant legal best practices, providing technical training, and raising awareness of the potential of e-commerce among stakeholders including the courts, the civil service, and government.

8.2.4 Strengthening the Business Environment

The task of making the business environment more friendly to the knowledge economy will entail making changes across a broad spectrum of macroeconomic, fiscal, governance, and social issues. Creating a regulatory environment conducive to the development of the knowledge economy is a task well beyond the scope of the Agenda alone. The Agenda, however, should provide tools to help in the evaluation

and direction of the overall policy and regulatory reforms. This will entail the following activities and institution building efforts:

- *Benchmarking* of Turkey's progress on the Agenda with that of its key international competitors, including the preparation, publication, and discussion of an annual government knowledge economy progress report. This benchmarking should stimulate learning by drawing on the experiences of other countries and pilots, should disseminate information on successes and failures and lessons learned, and should record best practices
- *Monitoring and evaluation procedures* to assess knowledge economy-related public investment activities such as technoparks, incubators, education programs, and e-development activities. These should include both ex ante and ex post assessment at the central and local levels. An electronic platform could be established to enable stakeholders to express their views and to promote public debate on related activities.
- *Awareness-raising and promotional activities* should be directed both at the public at large and at policymakers, through conferences, study tours, studies, and social mobilization campaigns. Such programs should reach out broadly to all segments of the population, and particularly those who are disengaged from new economic activities.
- *A sunset commission* should be established to identify redundant regulations. This should be a joint, tripartite working group, charged to perform a regular inventory of legal and regulatory obstacles to the knowledge economy and, from this perspective, to evaluate new regulatory and legal initiatives.
- *A knowledge economy policy council* also should be established, to be led by the Prime Minister and to include the key Ministers of Education, Finance, Labor, and Industry and others, as well as leading representatives of business and labor associations. The council should play a key role in guiding the implementation of the knowledge economy agenda.

8.3 INSTITUTIONAL CAPACITY

It is essential that the different institutions and their partners that have a vested interest in the knowledge economy agenda work together to implement the agenda's various activities. The experience of other countries indicates that high-level government officials must be involved, as well as all key interest groups—the business community, research and education community, trade unions, and others. The Agenda is also likely to have a regional dimension, requiring therefore the involvement of regional and local authorities, institutions and enterprises, and NGOs in the design, preparation, and implementation of decentralized activities. This will require the use

of a consultative process and consensus building across the various components during the preparation phase, with the goal of bringing together the ideas and input of all interested parties.

The preparation of delivery mechanisms should take place under the leadership of parties that have strong local ownership, to ensure that local innovators and entrepreneurs are provided with the necessary financial, technical, and commercial services. It also should take advantage of all existing resources and networks already operating. The local coordinating structure should be capable of mobilizing the support required by innovative enterprises (independently from a central body, even if ultimately the structure would report to that body), or for pioneering new initiatives (including EU-related initiatives, such as EU innovation relay centers). The decentralized expansion of the Agenda is essential to the furtherance of the country's innovative and competitive capabilities, as it is widely recognized that innovation processes essentially take shape at the local level. This approach also fits well with existing government plans for devolution of many administrative and fiscal responsibilities to local and regional authorities.

The institutions tasked with spearheading the knowledge economy agenda must first undergo capacity building if they are to be able to execute such an ambitious program. Technical assistance should be provided to these institutions, in particular with regard to the setting of guidelines for ICT standardization, rationalization, and project sequencing. Staff also will need to be trained in the coordination and enforcement of guidelines and standards. Finally, activities should be undertaken to advance ICT literacy among civil servants and policymakers. The necessary training programs could be outsourced to specialized service providers, thus feeding into the educational area of the Agenda.

9 Annex I. Policy Recommendations at a glance

9.1 INNOVATION POLICY FOR THE KNOWLEDGE ECONOMY

Expand and decentralize innovation support services and policies

The experience gained with the KOSGEB common workshops for artisans and the TUBITAK university–industry centers could be scaled up. Regional science and technology innovation councils, with a significant involvement of the local business community, should be established.

Promote world-competitive industries

A structure, of a public nature but with a private sector orientation, could be established with the funding from the main business associations (TUSIAD, TBV, TIM, and others). Such an agency could be possibly a subsidiary of the TTGV.

Stimulate university–industry collaboration

Grant-based incentives provided to stimulate the development of joint R&D projects or the establishment of joint R&D centers between university and industry should be increased. Measures specifically addressed to SMEs, such as (systematic) partial subsidies (50 percent) of contracts made with university or government laboratories, could stimulate contacts with research structures. Measures such as the (systematic) partial subsidy of the employment of scientists and engineers could also strengthen the in-house R&D capabilities of SMEs.

Create incentives for university professors to cooperate with business

It is of utmost importance that counter incentives, such as the 50 percent retention by universities of individual consultancy contracts for academics, be eliminated.

Improve the regulatory environment for innovation and entrepreneurship

An audit should be conducted, under the joint auspices of the business sector and the government, to examine in a systematic manner areas of key importance for entrepreneurship and innovation. This would help to establish how recent stimulus measures have been implemented and to identify how successful they have been. It would also help identify what improvements are needed in areas such as procurement policy and customs regulations relating to the import/export of new technologies; what technical norms and regulations are problematic for new technologies; what financial rules act as deterrents to productive venture funding and the patent regime; and so forth. Suggestions

should be made post-audit on improvements to existing stimulus measures, and the audit commission should systematically follow up on their application.

Take advantage of FDI to bring innovations

Communities should organize themselves to respond rapidly to new demand for skilled labor. A tripartite approach is needed that mobilizes the business sector, the education institutions, and local and central authorities. Technical support should be provided to Turkish components and materials suppliers, as should legal assistance in areas such as technology licensing and acquisition.

Evaluate innovation policy measures

A report should be prepared on innovation policy and broadly discussed and disseminated. It should be completed within one to two years under the auspices of the reactivated SCST.

Scale up the successful innovation activities undertaken by TUBITAK, the TTGV, and others

The scaling up of the TTGV's activities would likely entail the decentralized expansion of the existing technology development financing program, venture capital funds, technology support services, start-up capital funds, and innovation centers. This could be achieved by way of "franchising" the TTGV experience through decentralized networks of private and public-private providers.

9.2 HUMAN RESOURCES FOR THE KNOWLEDGE SOCIETY

Develop occupational standards and assessments for vocational and professional programs

The work of the tripartite Council on Occupational Standards (MSK) should be continued, as this provides the basis for linking the demand from enterprises for skilled labor with the supply of trained personnel by the education and training sector. The council's work could be of particular importance in defining the new and emerging skills that are critical for the knowledge economy; it also could provide a launchpad for Turkish Institutions seeking to meet the requirements of the Barcelona Agreement.

Reform secondary education, including secondary vocational education, and improve linkages with Higher Vocational Schools (MYOs)

The 100-plus specialized vocational education programs should be replaced with 28 broad occupational training programs at the upper secondary education level. Specialized

training should be gradually transferred to the post-secondary MYO level, and nonformal training should be made the responsibility of NGOs and private enterprises.

Increase linkages between tertiary education and business

Stronger links should be forged between business and education institutions. This may be achieved in part by including representation from the business sector on university governing boards, through the targeted selection of university rectors, by setting up business advisory committees for academic faculties, and so forth.

Increase participation in international assessments and benchmarking programs

Turkey is not involved in the International Association for Evaluation and Educational Achievement Citizenship and Education Study (CES), the Program of International Student Assessment (PISA), the International Adult Literacy Study (IALS), or the new Adult Literacy and Life skills (ALL). Participation in these studies could enable benchmarking in accordance with OECD requirements and could help identify areas in which Turkey needs to restructure its programs and policies.

Change the approach to university governance

Internal executive boards should continue as they are, but universities would benefit also from a separate governing board. This board should have at most 15 members, including a minimum of 20 percent external members and some student representation, and should be chaired by a lay person chosen by members of the board. A maximum of 10 percent of board members should be nominated by the government. The position of university chief officer should be opened to competition, including to external applications. The search and selection committees additionally should include external membership, and the final decision should be made by the governing body.

Change the approach to the governance and administration of MYOs

It could be beneficial to separate the MYOs from the universities. The MYOs could be established under a national agency governed by their social partners, and reconstituted as regional technical colleges. They additionally should have their own governing boards of their social partners, chaired by a lay member; they should be free to establish their own criteria for appointing staff; they should develop their own programs as articulated by the need of local businesses; and they would need better facilities and equipment.

Create business advisory boards

Business advisory boards should be established at the institutional, and possibly faculty levels, to facilitate, strengthen, and formalize linkages with business. The boards should provide advice on the skill needs at the national and regional levels; assist with training internships, including the recognition of nonformal training and placement of graduates; advise on curriculum content; provide linkages for R&D and

technology transfer; support fund raising; and be advocates to government and the public for the institutions

Improve financing of tertiary education

The process of financing tertiary education needs to be restructured. Block grants to universities should be considered, with the recipient university required to match spending annually to a balanced budget, with any overspend to be charged to the following-year budget; there should be greater freedom to move funds between line items and to carry over funds from one year to the next; and MOF oversight of each institution should be removed. It also would be worthwhile considering funding to a formula that uses unit cost and national expenditure data by program and university, with small set-asides for YOK funding of national priority projects. The issue of low faculty salaries also should be addressed; for example, members should perhaps be permitted to take on limited consulting assignments, annual salaries could be disbursed over nine months, and salaries could be decoupled from the civil service.

Reform entry requirements to tertiary education

Consideration should be given to creating a national secondary school leaving exam that would provide a comprehensive evaluation of school achievements. This would replace the short arbitrary university entrance exam, which distorts the functioning of upper secondary schooling and has created a market for high-cost private tutoring, with the related inequities for poor families. Parliament must quickly approve the pending legislation that would set in place occupational standards and assessments that would in turn facilitate the recognition of formal and nonformal learning.

Strengthen adult continuing education

Specific financial and other incentives should be considered to encourage individuals and enterprises, particularly in the SME sector, to invest in skill development. These could include but should not be limited to: (a) tax incentives for individuals and enterprises; (b) targeted incentives to stimulate the delivery of high-priority knowledge economy services by public and private service providers; and (c) initiatives to promote skill development in SMEs in both the formal and nonformal sector.

Expand distance learning

Scale up the experience of Anadolu University in distance learning, perhaps by inviting all universities to participate with Anadolu in the development of a national curriculum. Students could enroll with the Anadolu Distance Learning Program for example, but study with a different participating university and receive their degree from that university (after the Irish model).

Refine quality assurance systems

Put in place (for both state and foundation universities) an institutional accreditation system based on best international practice. Scale up the experience of the several universities that already have achieved international recognition for their programs (such as the Middle East Technical University Quality Assurance program).

Stimulate demand for and the supply of knowledge economy skills using market-based mechanisms, supported by public-private initiatives where positive international experience exists

This could be stimulated through a public financial support program, designed to help citizens gain access to skills training courses. A program of this nature could finance a range of costs, including tuition fees for a defined period of time. Incentives should be provided to encourage suppliers—private sector in particular, but also public sector training providers, including universities and post-secondary technician training colleges—to develop flexible, modular, competency-based training content. Suppliers also should be encouraged to provide financing to cover the start-up costs needed to develop these skills training programs and to market them to the trainees financed on the demand side.

9.3 INFORMATION AND COMMUNICATION TECHNOLOGIES FOR THE KNOWLEDGE ECONOMY

Remove restrictions of entry, including restrictions on FDI

Reduce the immediate barriers to FDI, such as screening and notification procedures and management and operational restrictions, including restrictions on the employment of foreign nationals. The early legislative adoption of an EU-compliant regulatory package on electronic communications would greatly assist this process but the process should not be delayed until the adoption of such a package.

Prepare a thorough audit of all other restrictions on trade and investment, including restrictions on foreign ownership and related restraints in the ICT sector

All restrictions that cannot be justified, taking account of their costs and benefits and the interests of consumers, should be removed.

Increase Internet access and use

A Universal Access Fund (UAF) could be established in accordance with the electronic communications regulatory package of the EU, the draft law on electronic communications currently under consultation in Turkey, and the objectives of the e-Europe 2005 Action Plan. The UAF would be used to encourage private investment in

the provision of ICT access in targeted regions or locations. It would be allocated on a competitive tender basis in compliance with the aforementioned draft law. Closing the digital divide could be achieved in part through, for example, the provision of: (a) Internet access in libraries and post offices; (b) remote rural telecenters; and (c) multipurpose hubs serving SMEs, educational establishments, local government, and the public.

Strengthen the dynamics of the ICT production sector

Reexamine the future of the ICT production sector in the light of the development of the knowledge economy, the changing circumstances of global markets, and the privatization of Turk Telecom. Policies to promote ICT usage should be introduced to catalyze the production of relevant local content and applications. The software industry also could play a major role in engendering employment growth and boosting the local export trade. Any policy approach designed to increase ICT usage should be reinforced by a tightly coordinated interagency approach and should be afforded government leadership.

Strengthen public and private demand for ICT equipment and services

The prospects for increasing the penetration of low-cost, Internet-compatible terminals are considerable given the demand from the education sector arising from the Basic Education Project. There is also significant potential for new demand generated by a comprehensive e-government implementation strategy. Turkey is committed to compliance with WTO and EU requirements, but within this compliance regime it should remain possible to encourage a significant element of competitive domestic supply. The opportunities for ICT production and possible exports could be significantly enhanced.

Update the ICT legal and institutional environment

Turkey should adopt an EU-compliant e-communications regulatory package. The new law should be enacted as soon as possible to afford to the economy the greatest benefit from the cost drivers and other advantages of ICT. There is no need to tie the introduction of the law to the accession timetable.

Prepare an e-readiness assessment and a multi-year investment program, combined with an implementation roadmap

A strategic investment program and implementation roadmap would establish priorities and enable the appropriate phasing of the investment needs of government-wide applications. The roadmap also would permit proper assessment of the potential linkages and synergies, and would enable programs to be aligned closely with the public administrative reform. It additionally should identify any activities that are suitable for public-private partnerships or outsourcing.

Initiate an e-procurement application

E-Procurement is a strategic application that has proven capable of yielding up to 20 percent in savings in annual public procurement budgets. It also can increase the participation of knowledge-intensive SMEs in public tenders and can improve governance and transparency. Subject to the passage of appropriate procurement legislation, an e-procurement model could quickly be rolled out in selected agencies that handle a high volume of procurement.

Initiate an e-interface between the government and citizens and businesses

Online services can alleviate the administrative burden faced by government, for example in the dispersal of basic documents and information, and can reduce corruption. These services can include, for example, the filing of business registration documents online, and for citizens can include the submission of applications for pension benefits, the registration of deaths, marriages, and births, and other administrative services. Ultimately they could extend to online tax payment.

Promote e-commerce

The government must create conditions conducive to the development of e-commerce. Critically, it must address the current gaps in the legal enabling environment for e-commerce. In particular, it should determine best practices in cyber legislation and should provide technical training for stakeholders including the courts, the civil service, and government leadership.

9.4 BUSINESS ENVIRONMENT AND THE KNOWLEDGE ECONOMY

Benchmark Turkey's progress on its knowledge economy agenda with that of its key competitors. This should include the preparation, publication, and discussion of an annual government knowledge economy progress report

This benchmarking should aim to stimulate learning from other countries and pilots, disseminate information on the successes and failures and lessons learned, and record best practices.

Monitor and evaluate procedures to assess knowledge economy-related public investment activities such as technoparks, incubators, education programs, and e-development activities

These procedures should include both ex ante and ex post assessment at the central and local levels. An electronic platform should be established to permit stakeholders to express their views and to support public debate about specific knowledge economy activities.

Raise awareness of the public at large and of policymakers

An awareness program should be implemented that reaches out broadly to all segments of the population, including particularly those who are disengaged from new economic activities.

Establish a sunset commission for redundant regulations

A joint, tripartite working group should be established to carry out a regular inventory of the legal and regulatory obstacles to the knowledge economy, and from this perspective to evaluate new regulatory and legal initiatives.

Establish a knowledge economy policy council

This council should be led by the Prime Minister and should include the key Ministers of Education, Finance, Labor, and Industry, and others, as well as leading representatives of the business and labor associations. The council would play a key role in guiding the implementation of the knowledge economy agenda (KEA).

Involve regional and local authorities, institutions and enterprises, and NGOs in the design, preparation, and implementation of decentralized activities

A consultative process and consensus-building mechanisms should be set up, using the Internet, to bring together during the preparation phase the interests and ideas of the different parties associated with the KEA.

Build leadership and ownership of the knowledge economy agenda

Local coordinating structures, operating independently from the central body, will be needed to mobilize support for innovative local enterprises and for pioneering new initiatives, including EU-related initiatives.

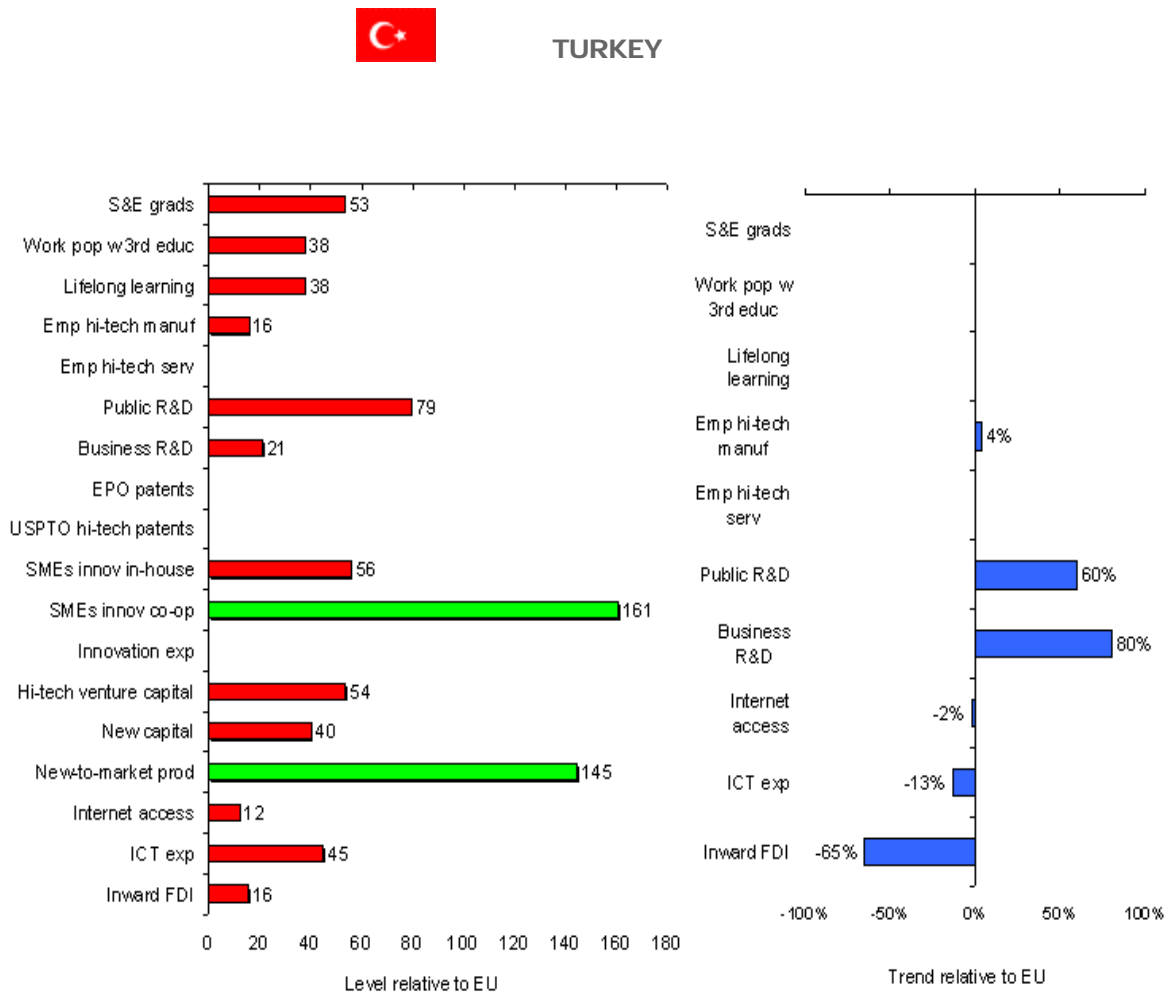
Built capacity to execute the knowledge economy agenda

Technical assistance should be provided to implementing institutions, in particular with regard to setting guidelines for ICT standardization, rationalization, and the project sequencing of specific activities. This will require that staff be trained to coordinate and enforce guidelines and standards. Training programs also should be provided that promote ICT literacy among civil servants and policymakers. These programs could be outsourced to specialized service providers, therefore feeding the educational area of the KEA.

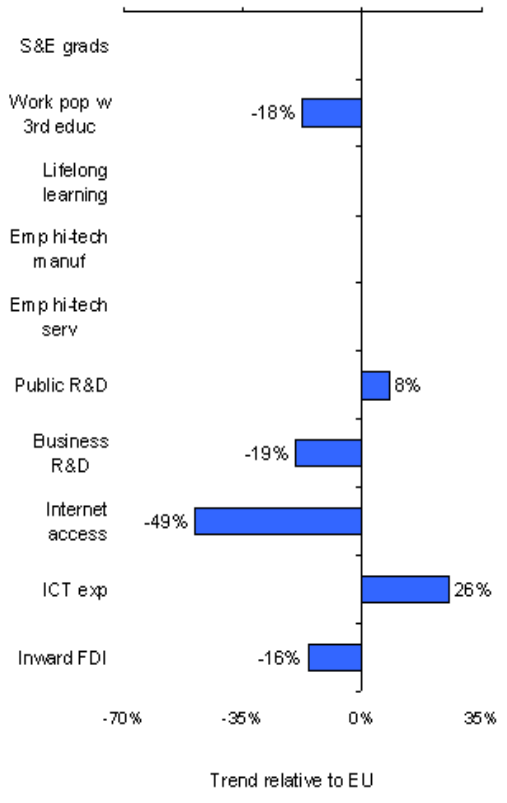
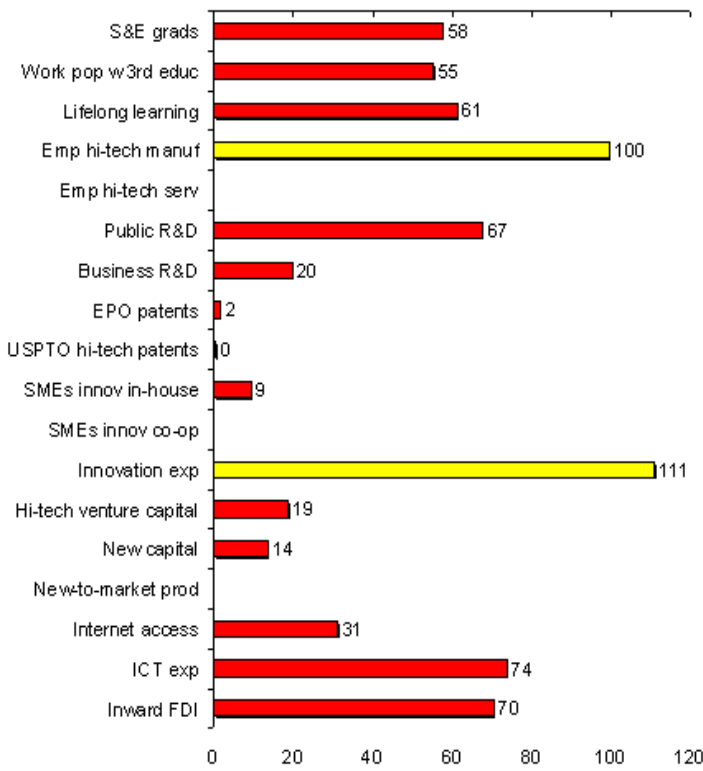
10 ANNEX II. TURKEY AND ITS KNOWLEDGE ECONOMY COMPETITORS

10.1 TURKEY AND POLAND: 2002 EUROPEAN INNOVATION SCOREBOARD

(Source: Retrieved from the Internet at <http://trendchart.cordis.lu/Scoreboard2002/index.html>)



 POLAND



10.2 WBI KNOWLEDGE ECONOMY INDEXES FOR TURKEY, POLAND, MEXICO, AND THE REPUBLIC OF KOREA

(Source: World Bank Institute, retrieved from the Internet at <http://www1.worldbank.org/gdln/kam.htm>)

Turkey at a Glance 2000

Population : 65.3 million
Surface area : 774.8 thousand sq km
Population per sq. km : 84.8
Population growth : 1.5 percent
Life expectancy : 70 years
GNI per capita : US\$3,080
GDP : US\$199.3 billion

Poland at a Glance 2000

Population : 38.7 million
Surface area : 323.3 thousand sq km
Population per sq. km : 127.0
Population growth : -0.0 percent
Life expectancy : 73 years
GNI per capita : US\$4,190
GDP : US\$157.6 billion

Mexico at a Glance 2000

Population : 98.0 million
Surface area : 1,958.2 thousand sq km
Population per sq. km : 51.3
Population growth : 1.4 percent
Life expectancy : 73 years
GNI per capita : US\$5,110
GDP : US\$580.1 billion

Republic of Korea at a Glance 2000

Population : 47.3 million
Surface area : 99.3 thousand sq km
Population per sq. km : 478.8
Population growth : 0.9 percent
Life expectancy : 73 years
GNI per capita : US\$8,960
GDP : US\$461.5 billion

Turkey, Poland, Mexico and Korea Selected Indicators

General Variables

Average annual GDP growth (% , 1990–99) (WDI 2001)

Turkey = 3.80; Poland = 4.50; Mexico = 2.70; Korea = 5.70;

Human Development Index (1999) (UNDP 2001)

Turkey = 0.73; Poland = 0.83; Mexico = 0.79; Korea = 0.88;

Unemployment rate (% of labor force, 1996–98) (WDI 2001)

Turkey = 6.20; Poland = 10.50; Mexico = 2.30; Korea = 6.80;

Productivity growth (% change of GDP per person employed, 2000) (IMD 2001)

Turkey = 4.61; Poland = 7.61; Mexico = 1.88; Korea = 0.86;

Variables of Economic Regime

Gross capital formation (average % of GDP, 1990–99) (SIMA 2001)

Turkey = 24; Poland = 21; Mexico = 23; Korea = 34;

Trade (% of GDP, 1999) (WDI 2001)

Turkey = 50; Poland = 59; Mexico = 63; Korea = 81;

Overall central govt. budget deficit (% of GDP, 1999)

Turkey = -13.00; Poland = -0.90; Mexico = - 1.4; Korea = -1.3;

Intellectual property is well protected (WEF 2001)

Turkey = 3.10; Poland = 3.80; Mexico =3.60; Korea = 4.00;

Local competition (WEF 2001)

Turkey = 5.30; Poland = 5.20; Mexico = 5.00; Korea = 4.10;

Protection of property rights (WEF 2001)

Turkey = 4.20; Poland = 4.60; Mexico =4.60; Korea = 4.70;

Variables of Governance

Regulatory framework (WBI 2001)

Turkey = 0.04; Poland = 0.41; Mexico =0.58; Korea = 0.30;

Government effectiveness (WBI 2001)

Turkey = -0.15; Poland = 0.27; Mexico =0.28; Korea = 0.44;

Political stability (WBI 2001)

Turkey = -0.75; Poland = 0.69; Mexico =0.06; Korea = 0.50;

Rule of law (WBI 2001)

Turkey = -0.16; Poland = 0.55; Mexico =-0.41; Korea = 0.55;

Voice and accountability (WBI 2001)

Turkey = -0.55; Poland = 1.21; Mexico =0.12; Korea = 0.98;

Control of corruption (WBI 2001)

Turkey = -0.48; Poland = 0.43; Mexico =-0.28; Korea = 0.37;

Variables for Innovation Systems

FDI (% of GDP, 1990–99) (SIMA 2001)

Turkey = 0.46; Poland = 2.39; Mexico = 2.19; Korea = 0.67;

Gross tertiary science and engineering enrollment ratio (WDI 2001)

Turkey = 9.50; Poland = 7.00; Mexico = 5.10; Korea = 22.0;

Manufacturing trade (% of GDP)

Turkey = 29.7; Poland = 40.4; Mexico = 51.7; Korea = 56.0;

Entrepreneurship among managers (IMD 2001)

Turkey = 6.61; Poland = 6.04; Mexico = 4.88; Korea = 5.8;

Administrative burden for start-up ventures (WEF 2001)

Turkey = 4.1; Poland = 5.2; Mexico = 3.2; Korea = 4.2;

Patent applications granted by the United States PTO (per million population, 2000) (USPTO 2000)

Turkey = 0.09; Poland = 0.29; Mexico = 0.71; Korea = 4.32;

Expenditure on R&D (% of GNI, 1987–97) (WDI 2001)

Turkey = 0.45; Poland = 0.77; Mexico = 0.33; Korea = 2.82;

Researchers in R&D/1 million of pop. (UNESCO 1999)

Turkey = 273; Poland = 1358; Mexico = 198; Korea = 2146;

Research collaboration between companies and universities (WEF 2001)

Turkey = 3.4; Poland = 3.8; Mexico = 3.2; Korea = 4.6;

Number of technical papers per million people (1997) (WDI 2001)

Turkey = 3.53; Poland = 4.64; Mexico = 3.03; Korea = 4.6;

Availability of venture capital (WEF 2001)

Turkey = 2.00; Poland = 3.00; Mexico = 2.3; Korea = 4.1;

High-technology exports (% of manufactured exports, 1999) (WDI 2001)

Turkey = 4.00; Poland = 3.00; Mexico = 21.0; Korea = 32.0;

Variables for Education and Human Resources

Adult literacy rate (% , age 15 and above, 1999) (UNDP 2001)

Turkey = 84.6; Poland = 99.7; Mexico = 91.1; Korea = 97.6;

Tertiary education enrollment (1998) (WDI 2001)

Turkey = 14.00; Poland = 52.00 Mexico = 18.0; Korea = 66.0;

Secondary school enrollment (1998)

Turkey = 32; Poland = 91 Mexico = 90; Korea = 100;

Public spending on education (% of GDP, 1999) (WDI 2001)

Turkey = 3.20; Poland = 5.00 Mexico = 4.4; Korea = 4.4;

Eighth grade achievement in science (TIMSS 1999)

Turkey = 433.0; Poland = n/a Mexico = n/a; Korea = 549.0;

Professional and technical workers (% of the labor force) (ILO 2000)

Turkey = 6.11; Poland = 21.60 Mexico = 13.2; Korea = 16.7;

Variables for ICT

Telephones per 1,000 people (including mobile phones, 1999) (ITU 2000)

Turkey = 532; Poland = 455 Mexico = 268; Korea = 1033;

Mobile phones per 1,000 people (1999) (ITU 2000)

Turkey = 245; Poland = 174 Mexico = 143; Korea = 567;

Television sets per 1,000 people (1999) (WDI 2001)

Turkey = 330; Poland = 388 Mexico = 268; Korea = 361;

Daily newspapers per 1,000 people (1996) (WDI 2001)

Turkey = 111; Poland = 113 Mexico = 97; Korea = 392;

Rating of computer processing power (% of total worldwide MIPS (million instructions per second) per million population, 1998) (IMD 2001)

Turkey = 0.005; Poland = 0.012; Mexico = 0.010; Korea = 0.035;

Cost of phone call to the United States (US\$/three-minute call, 1999) (WDI 2001)

Turkey = 3.31; Poland = 3.65 Mexico = 3.0; Korea = 1.8;

E-government (WEF 2001)

Turkey = 3.2; Poland = 4.10 Mexico = 3.9; Korea = 4.5;

Computers per 1,000 people 1999 (ITU 2000)

Turkey = 34; Poland = 62 Mexico = 44; Korea = 181;

Radios per 1,000 people (1999) (WDI 2001)

Turkey = 179; Poland = 523 Mexico = 324; Korea = 1033;

Investment in telecommunications (% of GDP, 1998) (IMD 2001)

Turkey = 0.30; Poland = 0.85; Mexico = 0.38; Korea = 0.96

Internet hosts per 10,000 people (2000) (ITU 2001)

Turkey = 2.87; Poland = 4.22; Mexico = 3.14; Korea = 4.62;

Information Society Index (IDC) 2000

Turkey = 45; Poland = 30; Mexico = 44; Korea = 22;

ICT expenditure (% of GDP, 1999) (WDI 2001)

Turkey = 2.47; Poland = 4.90 Mexico = 4.2; Korea = 4.4;

10.3 COST OF DOING BUSINESS IN TURKEY, POLAND, MEXICO, AND THE REPUBLIC OF KOREA

Source: World Bank. Retrieved from the Internet at <http://rru.worldbank.org/doingbusiness/>

Turkey			
Economy Characteristics			
Variable	Turkey	Regional Average	OECD Average
Region	Europe and Central Asia		
Income category	Lower-middle income		
Legal origin	French		
GNI per capita (US\$)	2,500	2,478	23,135
Informal economy (% GNI)	32.1	37.7	17.4
Population	68,529,000	18,594,474	41,068,094
Starting a Business (2003) (number of procedures to start a business)			
Indicator	Turkey	Regional Average	OECD Average
Number of procedures	13	10	7
Duration (days)	38	47	30
Cost (% of GNI per capita)	37.1	21.7	10.2
Minimum capital (% of GNI per capita)	13.2	114.0	61.2
Hiring and Firing Workers (2003)			
Indicator	Turkey	Regional Average	OECD Average
Flexibility of Hiring Index	58	51	49
Conditions of Employment Index	91	82	58
Flexibility of Firing Index	17	39	28
Employment Laws Index	55	57	45
Notes: Index components are scored between 0 and 100, with 100 representing the highest level of regulation. The Employment Laws Index is the average of the first three indexes, and varies from 0 to 100.			

indexes, and varies from 0 to 100.

Enforcing Contracts (2003) (covers formality of procedures and time to resolve a dispute)

Indicator	Turkey	Regional Average	OECD Average
Number of procedures	18	25	17
Duration (days)	105	344	233
Cost (% GNI per capita)	5.4	27.9	7.1
Procedural Complexity Index	38	56	49

Notes: Sub-index components are scored between 0.0 and 1.0, with 1.0 representing the highest level of formality. The Procedural Complexity Index is constructed by averaging the six sub-indexes and multiplying the resulting value by 100. It ranges from 0 to 100.

Getting Credit (2003)

Indicator	Turkey	Regional Average	OECD Average
Public credit registry operates?	Yes		
Year public credit registry established	1951		
Public credit registry coverage (borrowers per 1,000 people)	7.0	2.0	43.2
Public Credit Registry Index	44	19	18
Private credit bureau operates?	Yes		
Private bureau coverage (borrowers per 1,000 people)	204.0	38.6	443.5
Creditor Rights Index	2	2	1

Notes: The Public Credit Registry Index ranges from 0 to 100. Higher values indicate that the rules of the public credit registry on collection, distribution, access, and quality are better designed to support credit transactions. The Creditor Rights Index is calculated by assigning a value of 1.0 for a "yes" response on each of the four types of creditor rights and then summing the total score across all four variables. A minimum score of 0 represents weak creditor rights and the maximum score of 4 represents strong creditor rights.

Closing a Business (2003)

Indicator	Turkey	Regional Average	OECD Average
Actual time (years)	1.8	3.2	1.8
Actual cost (% of estate)	8	15	7
Goals of Insolvency Index	51	51	77
Court Powers Index	67	57	36

Number of procedures	18	25	17
Duration (days)	1,000	344	233
Cost (% GNI per capita)	11.2	27.9	7.1
Procedural Complexity Index	65	56	49

Notes: Sub-index components are scored between 0.0 and 1.0, with 1.0 representing the highest level of formality. The Procedural Complexity Index is constructed by averaging the six sub-indexes and multiplying the resulting value by 100. It ranges from 0 to 100.

Getting Credit (2003)

Indicator	Poland	Regional Average	OECD Average
Public credit registry operates?	No		
Year public credit registry established	..		
Public credit registry coverage (borrowers per 1,000 people)	0.0	2.0	43.2
Public Credit Registry Index	0	19	18
Private credit bureau operates?	Yes		
Private bureau coverage (borrowers per 1,000 people)	543.0	38.6	443.5
Creditor Rights Index	2	2	1

Notes: The Public Credit Registry Index ranges from 0 to 100. Higher values indicate that the rules of the public credit registry on collection, distribution, access, and quality are better designed to support credit transactions. The Creditor Rights Index is calculated by assigning a value of 1.0 for a "yes" response on each of the four types of creditor rights and then summing the total score across all four variables. A minimum score of 0 represents weak creditor rights, and the maximum score of 4 represents strong creditor rights.

Closing a Business (2003)

Indicator	Poland	Regional Average	OECD Average
Actual time (years)	1.5	3.2	1.8
Actual cost (% of estate)	18	15	7
Goals of Insolvency Index	70	51	77
Court Powers Index	67	57	36

Economy Characteristics

Procedural Complexity Index	62	70	49
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Notes: Sub-index components are scored between 0.0 and 1.0, with 1.0 representing the highest level of formality. The Procedural Complexity Index is constructed by averaging the six sub-indexes and multiplying the resulting value by 100. It ranges from 0 to 100.

Getting Credit (2003)

Indicator	Mexico	Regional Average	OECD Average
Public credit registry operates?	No		
Year public credit registry established	..		
Public credit registry coverage (borrowers per 1,000 people)	0.0	53.2	43.2
Public Credit Registry Index	0	35	18
Private credit bureau operates?	Yes		
Private bureau coverage (borrowers per 1,000 people)	382.0	196.6	443.5
Creditor Rights Index	0	1	1

Notes: The Public Credit Registry Index ranges from 0 to 100. Higher values indicate that the rules of the public credit registry on collection, distribution, access, and quality are better designed to support credit transactions. The Creditor Rights Index is calculated by assigning a value of 1.0 for a "yes" response on each of the four types of creditor rights and then summing the total score across all four variables. A minimum score of 0 represents weak creditor rights, and the maximum score of 4 represents strong creditor rights.

Closing a Business (2003)

Indicator	Mexico	Regional Average	OECD Average
Actual time (years)	2.0	3.7	1.8
Actual cost (% of estate)	18	15	7
Goals of Insolvency Index	61	46	77
Court Powers Index	67	63	36

Economy Characteristics

Cost (% GNI per capita)	4.5	7.1	7.1
Procedural Complexity Index	50	49	49

Notes: Sub-index components are scored between 0.0 and 1.0, with 1.0 representing the highest level of formality. The Procedural Complexity Index is constructed by averaging the six sub-indexes and multiplying the resulting value by 100. It ranges from 0 to 100.

Getting Credit (2003)

Indicator	Korea	Regional Average	OECD Average
Public credit registry operates?	No		
Year public credit registry established	..		
Public credit registry coverage (borrowers per 1,000 people)	0.0	43.2	43.2
Public Credit Registry Index	0	18	18
Private credit bureau operates?	Yes		
Private bureau coverage (borrowers per 1,000 people)	530.0	443.5	443.5
Creditor Rights Index	3	1	1

Notes: The Public Credit Registry Index ranges from 0 to 100. Higher values indicate that the rules of the public credit registry on collection, distribution, access, and quality are better designed to support credit transactions. The Creditor Rights Index is calculated by assigning a value of 1.0 for a "yes" response on each of the four types of creditor rights and then summing the total score across all four variables. A minimum score of 0 represents weak creditor rights, and the maximum score of 4 represents strong creditor rights.

Closing a Business (2003)

Indicator	Korea	Regional Average	OECD Average
Actual time (years)	1.5	1.8	1.8
Actual cost (% of estate)	4	7	7
Goals of Insolvency Index	91	77	77
Court Powers Index	67	36	36

10.4 GLOBAL COMPETITIVENESS: WORLD ECONOMIC FORUM

(Source: WEF. Retrieved from the Internet at

http://www.weforum.org/pdf/Gcr/GCR_2003_2004/Competitiveness_Rankings.pdf)

GROWTH COMPETITIVENESS INDEX RANKINGS			
Country	Growth Competitiveness ranking 2003	Growth Competitiveness ranking 2003 among GCR 2002 countries	Growth Competitiveness ranking 2002*
Finland	1	1	1
United States	2	2	2
Sweden	3	3	3
Denmark	4	4	4
Taiwan	5	5	6
Singapore	6	6	7
Switzerland	7	7	5
Iceland	8	8	12
Norway	9	9	8
Australia	10	10	10
Japan	11	11	16
Netherlands	12	12	13
Germany	13	13	14
New Zealand	14	14	15
United Kingdom	15	15	11
Canada	16	16	9
Austria	17	17	18
Korea	18	18	25
Malta	19	—	—
Israel	20	19	17
Luxembourg	21	—	—
Estonia	22	20	27
Spain	23	21	20
Hong Kong SAR	24	22	22
Portugal	25	23	19
France	26	24	28
Belgium	27	25	21
Chile	28	26	24
Malaysia	29	27	30
Ireland	30	28	23
Slovenia	31	29	26
Thailand	32	30	37
Hungary	33	31	29
Jordan	34	32	44
Greece	35	33	31
Botswana	36	34	35
Latvia	37	35	43
Tunisia	38	36	32
Czech Republic	39	37	36
Lithuania	40	38	39
Italy	41	39	33
South Africa	42	40	34
Slovak Republic	43	41	46
China	44	42	38
Poland	45	43	50
Mauritius	46	44	41
Mexico	47	45	53
El Salvador	48	46	60
Trinidad and Tobago	49	47	42
Uruguay	50	48	40
Costa Rica	51	49	49
Namibia	52	50	47
Croatia	53	51	48
Brazil	54	52	45
Gambia	55	—	—
India	56	53	54
Peru	57	54	55
Egypt	58	—	—
Panama	59	55	51
Vietnam	60	56	62
Morocco	61	57	52
Dominican Republic	62	58	56
Colombia	63	59	61
Bulgaria	64	60	58
Turkey	65	61	65

BUSINESS COMPETITIVENESS INDEX RANKINGS			
Country	Business Competitiveness ranking 2003	Business Competitiveness ranking 2003 among GCR 2002 countries	Business Competitiveness ranking 2002*
Finland	1	1	2
United States	2	2	1
Sweden	3	3	6
Denmark	4	4	8
Germany	5	5	4
United Kingdom	6	6	3
Switzerland	7	7	5
Singapore	8	8	9
Netherlands	9	9	7
France	10	10	15
Australia	11	11	14
Canada	12	12	10
Japan	13	13	11
Iceland	14	14	17
Belgium	15	15	13
Taiwan	16	16	16
Austria	17	17	12
New Zealand	18	18	22
Hong Kong SAR	19	19	19
Israel	20	20	18
Ireland	21	21	20
Norway	22	22	21
Korea	23	23	23
Italy	24	24	24
Spain	25	25	25
Malaysia	26	26	26
South Africa	27	27	29
Estonia	28	28	30
Latvia	29	29	45
Slovenia	30	30	27
Thailand	31	31	35
Chile	32	32	31
Tunisia	33	33	32
Brazil	34	34	33
Czech Republic	35	35	34
Portugal	36	36	36
India	37	37	37
Hungary	38	38	28
Greece	39	39	43
Lithuania	40	40	40
Jordan	41	41	53
Malta	42	—	—
Slovak Republic	43	42	42
Mauritius	44	43	49
Costa Rica	45	44	39
China	46	45	38
Poland	47	46	46
Mexico	48	47	55
Morocco	49	48	48
Vietnam	50	49	60
Colombia	51	50	56
Turkey	52	51	54
Trinidad and Tobago	53	52	44
Botswana	54	53	57
Namibia	55	54	51
Jamaica	56	55	59
Sri Lanka	57	56	47
Egypt	58	—	—
Panama	59	57	50
Indonesia	60	58	64
Dominican Republic	61	59	41
Croatia	62	60	52
El Salvador	63	61	63
Philippines	64	62	61
Russian Federation	65	63	58