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ECONOMIC IMPLICATIONS OF EU ACCESSION FOR TURKEY

Sübidey Togan

With accession to the European Union (EU), Turkey will complete the harmonization of its technical regulations, liberalize entry and exit into various sectors of its economy, impose hard budget constraints on all of its public and private enterprises, adopt the EU's Common Agricultural Policy (CAP), liberalize its trade with the EU in services, and join the European single market. Furthermore, joining the EU will require Turkey to adopt and implement the whole body of EU legislation and standards—the *acquis communautaire.* According to the EU membership criteria, new members must be able to demonstrate the "ability to take on the obligations of membership including adherence to the aims of political, economic and monetary union." Thus Turkey is expected to adopt the euro when it is ready to do so, but not immediately upon accession.

Welfare Effects of Integration

Any study of the effects of integration on the Turkish economy must keep in mind that the customs union in industrial goods between the EU and Turkey was established in 1996 and that a period of perhaps 10 years or more will precede full membership and Turkish participation in the internal market. Harrison, Rutherford, and Tarr (1997), who have calculated the impact of the customs union in industrial goods on Turkish welfare, estimate that the gains to Turkey will amount to 1.1 percent of its gross domestic product (GDP) per year. If liberalizing trade in industrial goods can affect the GDP, then there should be comparable gains from liberalizing agriculture and also services.

Agriculture

Because Togan, Bayener, and Nash thoroughly study in chapter 2 of this volume the impact of EU enlargement to Turkey on Turkey's agricultural markets and incomes, this section only briefly summarizes the main points presented by the authors. According to Togan and his colleagues, adoption of the CAP will lead to substantial changes in the agricultural incomes of producers, the welfare levels of consumers, and the budget revenues of the government. Because the prices for many major agricultural products in Turkey will have to be reduced at some point between now and accession, consumers will derive great benefits. The authors estimate that, in the medium to long term, EU-like policies will lead to a 1.87 percent increase in real household incomes in Turkey, which is equivalent to about €2.92 billion. Lower-income households (rural households) will experience an even more significant increase in real income.

Yet adoption of the CAP will require substantial adjustments on the part of Turkish farmers, and the effect on farmers' incomes will be driven mainly by

TABLE 12.1 Impact of Agenda 2000 Policies
(millions of euros)

Effect on real income	2,916
Effect on agricultural value added	
Direct payments equal to those applied in the EU	2,145
Direct payments at 35 percent of payments granted in EU countries	341
Effect on government budget	−2,998

Source: Chapter 2 of this volume.

the amount of CAP-like compensation payments granted to farmers. Farmers' incomes will decrease considerably under Agenda 2000 policies without direct payments and will increase under Agenda 2000 policies with direct payments. Table 12.1 shows that agricultural value added will increase by €2.15 billion under Agenda 2000 policies with direct payments equal to those applied in the EU and by €0.34 billion under Agenda 2000 policies with direct payments equal to 35 percent of payments granted in the EU member countries.

The budgetary costs to Turkey of adopting EU-like agricultural policies will depend on whether Turkey receives compensation from the EU budget for introducing these policies. If Turkey does not receive any compensation from the EU budget, the cost will amount to €3 billion under Agenda 2000 policies with direct payments equal to those applied in the EU and to €1.2 billion under Agenda 2000 policies with direct payments equal to 35 percent of payments granted in the EU member countries.

Services and Network Industries

To join the EU, Turkey must liberalize its services and network industries. This section considers the banking, telecommunications, transportation, electricity, and natural gas sectors as representative of those making up Turkey's services and network industries.

Banking Sector Before 1999, Turkey lacked the crucial components of financial markets: competent supervisory authorities, a regulatory framework, and a legal and institutional infrastructure. In addition, regulations in Turkey were lax and poorly enforced. In February 2001, Turkey faced a currency crisis. The cost of this crisis in terms of its effect on the banking sector has been estimated at US$46 billion,[1] or about 27–30 percent of the Turkish GDP (the crisis and its effects are described in more detail by Pazarbaşıoğlu in chapter 6). After the crisis, Turkey changed its legislative, regulatory, and institutional framework. As of 2004, Turkish prudential requirements related to capital adequacy standards, loan classification and provisioning requirements, limits on large exposures, limits on connected lending, and requirements for liquidity and market risk management were generally in conformity with those of the EU.

The welfare effects of policies followed by Turkey in the banking sector are illuminated by comparing a base case—the Turkish economy operating under the rules and regulations that prevailed in the banking sector during the latter half of the 1990s—with a case in which Turkey adopts and implements in the banking sector all of the rules and regulations of the EU.

The effects of the adoption of EU rules and regulations in the banking sector on the price of banking services are illuminated by a study by McGuire and Schuele (2000) in which they develop index values of restrictiveness in financial services for several countries. McGuire and Schuele, in extending the work of McGuire (1998), base their analysis on 1997 data and distinguish between prudential and nonprudential requirements. The authors note that prudential requirements aimed at ensuring the stability of the banking system by preserving solvency, limiting risks, and protecting bank deposits are, in general, similar across economies. Therefore, they abstract from consideration of prudential requirements and concentrate on nonprudential requirements. The index values of the nonprudential variables considered by McGuire and Schuele (2000) are shown in table 12.2; scores range from 0 (least restrictive) to 1 (most restrictive). In the table, the restrictions have been divided into two groups: those affecting "commercial presence" and "restrictions on ongoing operations." The first group indicates the restrictions on the movement of capital, and the second group is modeled as restrictions on trade in banking services. The commercial presence restrictions group covers restrictions on licensing, direct investment, joint venture arrangements, and the permanent movement of people. The other group covers restrictions on raising funds, lending

TABLE 12.2 Restrictiveness Index Scores and Price Effects for Banking Services, EU and Turkey

	Restrictiveness Index		Price Effect (%)	
	EU	Turkey	EU	Turkey
Licensing of banks	0.0100	0.2000	0.7515	16.8479
Direct investment	0.0100	0.0100	0.7515	0.8424
Joint venture arrangements	0.0050	0.0525	0.3758	4.4226
Permanent movement of people	0.0085	0.0119	0.6403	1.0025
Restrictions on establishment total	0.0335	0.2744	2.5191	23.1154
Raising funds by banks	0.0075	0.0075	0.5636	0.6318
Lending funds by banks	0.0075	0.0075	0.5636	0.6318
Other business of banks—insurance and securities services	0.0050	0.0525	0.3758	4.4226
Expanding the number of banking outlets	0.0025	0.0131	0.1879	1.1056
Composition of board of directors	0.0119	0.0120	0.8973	1.0126
Temporary movement of people	0.0028	0.0074	0.2131	0.6213
Restrictions on ongoing operations total	0.0373	0.1000	2.8013	8.4257
Index value	0.0708	0.3744	5.3203	31.5410

Source: Australian Productivity Commission (http://www.pc.gov.au).

funds, providing other lines of business, expanding banking outlets, composition of the board of directors, and the temporary movement of people. Based on the scores shown in table 12.2 for each variable considered, the authors assign weights to the variables and obtain first restrictiveness index values for the two groups and then the overall restrictiveness index values for the economies considered.

Table 12.2 reveals that the Turkish banking system is more restrictive than the banking system in the EU. Kalirajan and others (2000) use this information to study the effects of restrictions in the banking sector on performance indicators. The authors note that banks provide a wide range of financial services, including deposit taking, lending, insurance, and securities. But they emphasize that, although banks are diversified entities, their core business remains matching depositors and lenders. Thus the price of banking services can be measured by the net interest margin—that is, the difference between the interest rate banks charge on their loans and the rate they pay on their deposits. Restrictions on trade in banking services is expected to increase the interest margin. The effect of these restrictions in the banking sector on the net interest margin is shown in the third and fourth columns of table 12.2 for the EU countries and Turkey. The table reveals that, as a result of restrictions in the banking sector, the net interest margin in the EU increases relative to the free trade net interest margin by 5.32 percent, and that the increase amounts to 31.54 percent for Turkey. One could thus infer that the net interest margin in Turkey will decrease by 26.22 percent when Turkey adopts and implements the EU rules and regulations on banking services.

Telecommunications The telecommunications industry in Turkey has been dominated by Türk Telekom, a national monopoly with exclusive rights to all fixed-line voice operations. It also provides cable services, and so also has been responsible for the radio and television transmitters. Türk Telekom has a monopoly on the provision of international calls, and prices for local calls through fixed lines were cross-subsidized by national long-distance and international calls. Reforms since the early 1990s have led to the introduction of four new mobile telephone companies and a series of private companies that provide value added services such as Internet access and cable television.

Akdemir, Başçı, and Locksley note in chapter 5 of this volume that the Turkish Parliament approved legislation to reform the telecommunications sector in 2000 and that the legislation was amended in May 2001. The reform program was quite successful in transforming the Turkish telecommunications system into a modern one. The objective of the legislative and regulatory reform was to bring the regulatory and supervisory regime for the Turkish telecommunications sector up to the level of international practice in line with EU standards. The objective has been achieved partially by opening the mobile telecom market to competition. With accession to the EU, Turkey will have to introduce full competition in telecommunications, and it will have to adopt and implement the EU legislative measures centering on liberalization of all telecommunications services and infrastructures, adoption of open network provision measures to the future competitive environment, maintenance and development of a minimum supply of services, and definition of common principles for financing the universal service.

The welfare effects of policies followed by Turkey in the telecommunications sector are studied here by comparing the situation of the Turkish economy in the base case—the Turkish economy operating under the rules and regulations that prevailed in the telecommunications sector during the latter half of the 1990s—with the case in which Turkey adopts and implements in the telecommunications sector all of the rules and regulations of the EU. The effects of adoption of EU rules and regulations in the telecommunications sector on the price of telecommunications services are examined as well. The telecommunications sector is a heterogeneous service industry just like the banking sector, and its services include fixed-line voice services (e.g., local, domestic, and international long-distance telephony), mobile services (mobile access, calls, and messaging services), Internet services (e.g., dial-up and Web hosting), data services (e.g., leased lines, asynchronous transfer mode [ATM] services, and public data network services), and content services (e.g., pay TV and online information and entertainment). Thus the price of telecommunications will be an index of all these prices.

Warren (2000a) considers four types of impediments to trade in telecommunications services: restrictions on cross-border trade, restrictions on establishment, restrictions on direct investment in fixed and mobile network services, and restrictions on ongoing operations. For each type, Warren derives index values, for which the higher values indicate greater restrictions. The index of restrictions on cross-border trade captures policies that discriminate against all potential entrants (domestic and foreign) seeking to supply cross-border telecommunications services, and the index of restrictions on establishment captures policies that discriminate against all potential entrants (domestic and foreign) seeking to supply telecommunications services via investment in the country. The index of restrictions on direct investment is designed to capture policies that discriminate against potential foreign entrants seeking to supply telecommunications services via investment in the country. Finally, the index of restrictions on ongoing operations captures policies that discriminate against potential foreign entrants seeking to supply cross-border telecommunications services. Based on the index values derived from an international survey undertaken by the International Telecommunications Union (1998) for 136 countries, Warren (2000b) estimates first the impact of impediments to trade and investment in telecommunications services on the penetration of fixed and mobile telecommunications network and thereafter the price impact.

The results are shown in table 12.3. The table reveals that Finland and the United Kingdom follow liberal trade and investment policies in telecommunications and that, as a result of restrictions in the trade of telecommunications services, Turkish telecommunications prices are 33.53 percent higher than the prices in Finland and the United Kingdom.

Transportation In the transportation sector, one can distinguish broadly between three different modes of transport: land transport (including rail and road transport), maritime transport, and air transport. In Turkey, road transport constitutes the significant portion of transport services. Roads carry an estimated 90 percent of domestic freight volumes and 40 percent of international freight values. The sector is competitive domestically; there are many competing firms; and access to the roads is relatively simple. Conditions in the international segment of the market are very different from those in the domestic freight segment, however.

TABLE 12.3 Restrictiveness Index Scores for Telecommunications Services

	Restrictiveness Index					Price Effect (%)				
	Restrictions on Establishment		Restrictions on Ongoing Operations			Restrictions on Establishment		Restrictions on Ongoing Operations		
	Restrictions on Direct Investment in Fixed and Mobile Network Services	Restrictions on Establishment Total	Restrictions on Cross-Border Trade	Restrictions on Ongoing Operations Total	Index Value	Restrictions on Direct Investment in Fixed and Mobile Network Services	Restrictions on Establishment Total	Restrictions on Cross-Border Trade	Restrictions on Ongoing Operations Total	Price Effect
Austria	0.1333	0.1333	0.0000	0.0000	0.1333	0.8480	0.8480	0.0000	0.0000	0.8480
Belgium	0.1334	0.1334	0.0667	0.0667	0.2001	0.8710	0.8710	0.4353	0.4353	1.3063
Denmark	0.0333	0.0333	0.0000	0.0000	0.0333	0.1985	0.1985	0.0000	0.0000	0.1985
Finland	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
France	0.2100	0.2100	0.0000	0.0000	0.2100	1.4298	1.4298	0.0000	0.0000	1.4298
Germany	0.0493	0.0493	0.0000	0.0000	0.0493	0.3195	0.3195	0.0000	0.0000	0.3195
Greece	0.1609	0.1609	0.3000	0.3000	0.4609	1.5778	1.5778	2.9424	2.9424	4.5202
Ireland	0.3533	0.3533	0.0000	0.0000	0.3533	2.6655	2.6655	0.0000	0.0000	2.6655
Italy	0.1369	0.1369	0.0000	0.0000	0.1369	1.0019	1.0019	0.0000	0.0000	1.0019
Luxembourg	0.1667	0.1667	0.0000	0.0000	0.1667	1.0458	1.0458	0.0000	0.0000	1.0458
Netherlands	0.0300	0.0300	0.0000	0.0000	0.0300	0.2025	0.2025	0.0000	0.0000	0.2025
Portugal	0.1100	0.1100	0.4000	0.4000	0.5100	1.3473	1.3473	4.8992	4.8992	6.2465
Spain	0.1793	0.1793	0.2333	0.2333	0.4127	1.7099	1.7099	2.2247	2.2247	3.9346
Sweden	0.1000	0.1000	0.0000	0.0000	0.1000	0.6530	0.6530	0.0000	0.0000	0.6530
U.K.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Turkey	0.3987	0.3987	0.4000	0.4000	0.7987	16.7384	16.7384	16.7944	16.7944	33.5328

Note: The restrictiveness index scores range from 0 to 1. The higher the score, the greater are the restrictions for an economy.
Source: Australian Productivity Commission (http://www.pc.gov.au).

Operations between countries are regulated by a web of bilateral and multilateral agreements that restrict quantity and capacity by limiting the number of permits available for a truck to make a journey between jurisdictions. Bilateral agreements generally prohibit cabotage.[2] Thus the domestic Turkish market is reserved for Turkish firms. By contrast, the road freight market within the EU for EU national firms is highly liberalized, including cabotage freight. Effectively, it is a single market in which the only entrance requirement is a national license from an EU country that permits unrestricted international and domestic carriage within the EU irrespective of the country of origin of the carrier within the EU. Ultimate access to the EU would largely solve the access problems of the Turkish industry, but it would also lead to increased competition from abroad.

As for rail transport, Turkish Railways is a national monopoly with exclusive rights to the transport of passengers and freight by rail in Turkey. By contrast, the EU *acquis* in the rail transport sector has been designed to improve the competitiveness of the rail transport sector and to liberalize rail transport markets. Harmonization of the current rules in the rail transport sector with the EU *acquis* requires that access rights be extended and that different organizational entities be set up for rail operations and infrastructure management in the rail transport sector. Functions such as rail capacity allocation, infrastructure charging, and licensing will have to be separated from rail operators. In addition, the financial relations between different parties and activities must be clearly defined by separation of accounts to enable the cost of operations to be accurately established and to avoid cross-subsidization.

Maritime transport is another area in which compliance with the EU *acquis* requires major changes in the sector. The EU *acquis* covers freedom to supply services, the requirements for competition, pricing practices, and the conditions to be applied to vessels carrying dangerous or polluting goods. As in road transportation, access to the Turkish maritime transportation market is restricted. With accession, access problems will be solved, and the sector will face increased competition from abroad.

Finally, in the air transport sector Turkey has taken major steps toward liberalizing air transport services. Major reforms were introduced during the 1980s. In this sector, Turkey will need to harmonize its regulations with those of the EU on civil aviation licenses, civil aviation rules and procedures, air carrier liability in the event of accidents, allocation of slots, ground handling at airports, aviation safety, and traffic management. But, overall, the existing structure will satisfy the requirements of the *acquis* on air transport services with relatively little alignment.

Francois's study in chapter 6 of this volume is helpful in determining the tariff equivalent of trade barriers in transportation services. Francois asserts that the tariff equivalent is roughly 8.9 percent.

Electricity The Turkish electricity sector is dominated by state-owned enterprises. The two largest firms are the Turkish Electricity and Transmission Company (TEAŞ) and the Turkish Electricity Distribution Company (TEDAŞ). Recently, TEAS was separated into three companies covering generation, trading, and transmission activities. Some privately owned firms have entered the industry through build-operate-transfer (BOT), build-operate-own (BOO), or auto-generator schemes. Today, these firms account for more than 21 percent of electricity generation. Under the regulations prevailing in Turkey, the private operators signed long-term power purchase agreements with the state-owned generation enterprise in which the enterprise committed itself to buying the output of the plants for a period of, say, 20 years at a fixed price in foreign currency. In these contracts, the price has been on average between $.08 and $.09 per kilowatt-hour for the first 5–10 years of operation. These contracts, guaranteed by the Treasury, assured investors that the projects would be profitable irrespective of the demand for power.

Recently, the government of Turkey passed, as noted by Atiyas and Dutz in chapter 7 of this volume, a new electricity law. The law provides for the establishment of a new independent Energy Market Regulatory Authority. With this law, the government is introducing a market model, like the one in the EU, that will transfer most of the task of supplying and distributing electricity and the associated market risks to the private sector, eliminate the need for additional state-guaranteed power purchase agreements, and minimize costs through competitive pressures on producers and distributors along the EU model.

The welfare effects of policies followed by Turkey in the electricity sector are studied here by comparing the situation of the Turkish economy in the base case—the Turkish economy operating under the rules and regulations that prevailed in the electricity sector during the latter half of the 1990s—with the case in which Turkey adopts and implements in the electricity sector all of the rules and regulations of the EU. The effects of regulation on the price of electricity are examined by means of table 12.4, which summarizes the status of the regulatory environment and market structure in the electricity sector in selected EU countries and Turkey as of 1998. In the electricity markets, competition can be secured as long as the principle of third party access (TPA) is observed. This principle is based on the idea that the owner of the network is obliged to give access to all delivery requests through the network by production and sales operators. The table shows that by 1998 Finland, Germany, and the United Kingdom had liberalized access to transmission and distribution networks, and that access liberalization in Finland and Britain had taken the form of regulated TPA, which is a legal obligation to provide network access under nondiscriminatory conditions. Germany has chosen the negotiated TPA arrangement, in which consumers and producers contract directly with each other and then negotiate with the transmission and distribution companies for access to the network. Turkey, by contrast, had not observed the principle of TPA by 1998, and it introduced this principle only in 2001 under the regulated TPA regime.

But TPA alone will not secure competition in the electricity sector. The owner of the network could charge high access prices, which would put the competitors in the final market at a disadvantage. The achievement of competition requires that the access charge be nondiscriminatory and cost-reflective and that it give the network owner the appropriate incentives to maintain and develop the infrastructure so that the system avoids bottleneck problems. The two dominant models for this approach are cost-based (rate of return) pricing and loosely regulated prices (the model more prevalent in countries with a decentralized electricity supply industry and a tradition of regulation and control on a more local level). Under rate of return regulation, the government sets the transmission prices so that they effectively guarantee a firm and "fair" rate of return. By contrast, under price cap regulation, prices are indexed to a moving indicator, such as the producer price index, less a portion that provides incentive for innovation and improved efficiency. Under this type of regulation, firms could realize negative returns in the short run if they are operating inefficiently. Table 12.4 reveals that Finland and Germany have introduced cost-based pricing and that the United Kingdom favors price cap regulation, but that Turkey did not have an explicit transmission pricing regulation during 1998.

The separation of generation and transmission, in tandem with expanded TPA, is crucial to encourage competition. Without separation, the network owner has very high incentives to preclude, or at least limit, the access of competitors in the downstream market, thereby eliminating liberalization. If the network owner does not participate in the downstream markets, it is neutral toward the applicants. Thus "unbundling" is important. The allocation of transmission rights must be separated from transactions between upstream and downstream firms. Where generation and transmission have been unbundled, there may be either an accounting separation, a legal separation, or a propriety separation into different companies. Accounting separation is the weakest form of separation, and legal separation is achieved through the creation of different companies under a common holding. Propriety separation is the preferred alternative.

Table 12.4 shows the degree of overall integration—from generation through transmission and distribution to supply—as well as the presence and type of separation of generation from transmission in each of the countries considered. Finland and the United Kingdom have separated generation and transmission into legally distinct firms, whereas Germany has introduced accounting separation. The table also shows that, distinct from liberalization, countries vary as well in the degree of private ownership that has developed over time, as well as in the decision made about privatization at the time of liberalization. Indeed, it reveals the current status of ownership in the generation segment of the electricity sector, and it provides details about privatization in electricity generation at the firm level for the countries selected. The decision to privatize does not necessarily correlate with the degree of liberalization. Germany has mixed ownership in

TABLE 12.4 Country Data on European and Turkish Electricity Sectors, 1998

	Finland	Germany	United Kingdom	Turkey
Regulatory reform				
Third party access (TPA)	Regulated TPA	Negotiated TPA	Regulated TPA	None
Electricity market	Finnish Electricity Exchange (1995)	None	English and Wales market (1990)	None
Transmission price regulation	Cost-based	Cost-based	Price cap	n.a.
Consumer choice thresholds	1995, 500 kW; 1997, 0 kW	1998, 0 kW	1990, 1 MW; 1994, 100 kW; 1998, 0 kW	No choice
Vertical integration in the industry				
Degree of vertical integration	Unbundled	Unbundled	Unbundled	Integrated
Generation separate from transmission	Separate companies	Accounting separation	Separate companies	Integrated
Ownership in the industry	Mostly public	Mixed	Private	Mostly public
Privatization in electricity generation	2/1/1997, Komijoki Oy, 25%	7/5/1994, Rhein-Main Donau, 75.5% 12/31/1995, Neckar, 99%	3/6/1991, National Power, 60% 3/6/1991, Power Gen, 60% 3/1/1995, National Power, 40% 3/1/1995, Power Gen, 40% 7/19/1996, British Energy, 87.73%	Private participation

n.a. Not applicable.
Sources: Steiner 2000 and the author.

the industry; the United Kingdom has made privatization a central feature of reform.

A further requirement for liberalization of electricity markets is the "opening of the demand side." This principle promotes the idea that eligible customers have the right to seek the most convenient supplier. The table reveals that Finland and the United Kingdom introduced consumer choice initially for large consumers and then gradually phased in full consumer choice, that Germany introduced full consumer choice immediately in 1998, and that Turkey had not opened the demand side by 1998.

Finally, competition requires the existence of exchange markets, which should yield prices in line with marginal costs covering fixed costs. By 1998 Finland and the United Kingdom had introduced such markets for electricity and allowed the prices and quantities traded to be determined by the equivalence of supply and demand. Germany and Turkey did not have such a market by 1998.

Steiner (2000), basically using the information provided in table 12.4, extends it to 19 Organisation for Economic Co-operation and Development (OECD) economies over the period 1986–96 and develops indexes of regulatory indicators, which he then uses to investigate empirically the linkages among regulatory regimes, market environments, and performance in electricity supply. Using the productive efficiency of generation plants and retail electricity prices as indicators of performance, Steiner concludes that unbundling of generation and transmission, expansion of the TPA, and introduction of electricity markets reduce the industrial end user prices. The results obtained by Steiner (2000) were later extended by Doove and others (2001) by increasing the number of countries considered from 19 to 50. The results are shown in table 12.5. As a result of restrictions, Turkish electricity prices are 20.7 percent higher than the prices in Finland and the United Kingdom, which follow liberal policies in the electricity sector.

TABLE 12.5 Price Impact of Regulation in Electricity Supply, EU and Turkey
(percent)

	Impact on Price
Austria	13.2
Belgium	15.4
Denmark	8.5
Finland	0.0
France	16.0
Germany	8.3
Greece	16.6
Ireland	13.9
Italy	17.1
Luxembourg	13.8
Netherlands	15.5
Portugal	17.9
Spain	9.5
Sweden	0.0
U.K.	0.0
Turkey	20.7

Source: Doove and others 2001.

Natural Gas The natural gas sector in Turkey is dominated by government-owned entities. The Petroleum Pipeline Corporation (BOTAŞ) owns the pipeline infrastructure for oil and gas transmission, liquefied natural gas (LNG) terminals, and the gas distribution network. BOTAŞ had monopoly rights for gas imports and exports and wholesale trading. In 2000, domestic consumption was 14.6 billion cubic meters, with imports accounting for 96 percent of consumption. Demand growth was about 17 percent a year between 1990 and 1999. The distribution of natural gas is carried out by local companies that are owned either by the municipalities or by BOTAŞ. Pricing was determined by BOTAŞ, with indirect influence by the government. In May 2001, the Turkish government passed, as described by Mazzanti and Biancardi in chapter 8 of this volume, a new gas law. With this law, the government plans to establish a competitive market like the one in the EU and encourage private sector participation through a phased policy. The Energy Market Regulatory Authority, which regulates both the gas industry and the electricity industry, determines the transmission and distribution access rules and tariffs and the method for regulating retail prices.

Competition in the electricity sector can be achieved as long as the competition upstream is sufficiently developed and network access is open, but the situation is quite different in the natural gas industry, where firms are burdened with long-term investments in the upstream phase (gas contracts

and infrastructures). They buy the gas from producers under long-term contracts with take-or-pay clauses. Under these obligations, gas purchasers must pay 70–90 percent of the contracted capacity whether they receive the natural gas or not. Thus firms have to sink huge investments in extraction fields and international pipelines, where they face huge fixed costs and almost zero marginal costs. In those cases, the extractor needs coverage from the market risk. It is often claimed that vertical integration is needed to cover firms' take-or-pay obligations. Table 12.6 describes the main features of the natural gas industry in EU countries for three main areas of interest: access to the network, the unbundling of monopolized activities from the competitive ones, and the opening of the demand side.

According to Polo and Scarpa (2003), three main issues must be determined for implementation of the TPA principle: (1) the technical and commercial conditions to be set for access (access price setting), (2) how disputes about access will be solved, and (3) the kind of regulatory regime to be used. According to the authors, a key aspect of the TPA is the institution that deals with disputes and acts as an arbitrator. In most of the EU countries, the regulatory authority intervenes in disputes in the natural gas sector (table 12.6). In Ireland, Luxembourg, and Spain, the Ministry of Industry is in charge of dispute resolution in this sector, but the authority is unspecified for France, Greece, and Portugal.[3] Finally, the national liberalization plans also differ in the kind of regulation that is adopted on the TPA. The majority of countries have chosen ex ante regulation in which the regulator sets the price and technical conditions in advance, rather than an ex post regime in which the regulator intervenes ex post on the tariffs communicated by firms.[4] Table 12.6 shows that demand opening, the third element to create a level playing field in the natural gas sector, has been treated rather differently across countries. Germany and the United Kingdom had already completed their process by 2000, and in most other countries the complete opening will be reached by 2007 at the latest. However, in some important countries—Denmark, France, Greece, and Portugal—a final date for the process has not been set. In Turkey, the process of liberalization began only in 2001 with the new gas law.

To weigh the overall effectiveness of the liberalization plans of the EU countries for the natural gas sector, Polo and Scarpa (2003) use a scoring procedure in which higher scores correspond to a more advanced solution. The authors find that the more

TABLE 12.6 EU Country Data on European Natural Gas Sectors

	Third Party Access				Demand Opening		
	Access Price Setting	Dispute Solution	Type of Regulation	Unbundling	Percent Eligible	Complete Opening	Score
Austria	Negotiated	Regulator	Ex post	Accounting	49	2001	10
Belgium	Regulator	Regulator	Ex ante	Legal	59	2005	16
Denmark	Regulator	Regulator	Ex post	Legal	30	Unspecified	11
Finland	Regulator	Regulator	Ex post	Proprietary	90	2003	21
France	Unspecified	Unspecified	Ex ante	Accounting	20	Unspecified	4
Germany	Negotiated	Antitrust	Ex post	Accounting	100	2000	12
Greece	Unspecified	Unspecified	Ex ante	Unspecified	Unspecified	Unspecified	2
Ireland	Ministry	Ministry	Ex ante	Legal	75	2005	14
Italy	Regulator	Regulator	Ex ante	Legal	65	2003	17
Luxembourg	Ministry	Ministry	Ex ante	Accounting	51	2007	11
Netherlands	Negotiated	Regulator	Ex ante	Accounting	45	2004	10
Portugal	Unspecified	Unspecified	Ex ante	Unspecified	Unspecified	Unspecified	2
Spain	Ministry	Ministry	Ex ante	Legal	72	2003	15
Sweden	Regulator	Regulator	Ex post	Accounting	47	2006	11
U.K.	Regulator	Regulator	Ex ante	Proprietary	100	1998	23

Source: Polo and Scarpa 2003.

advanced solutions have been adopted by Finland, Sweden, and the United Kingdom.

Welfare Effects

This section examines the welfare effects of Turkish accession to the EU by considering the 1996 input-output table of the Turkish economy. The table has 97 sectors. Of these, banking is sector 84; telecommunications, sector 83; transport via railways, sector 78; land transport, sector 79; water transport, sector 80; air transport, sector 81; electricity production, transmission, and distribution, sector 69; and natural gas, sector 70.

Consider the case in which Turkey adopts and implements the EU rules and regulations in the banking sector. A denotes the 97×97 matrix of input coefficients. Given A, the 96×96 input matrix B is formed by deleting the 84th column and 84th row referring to the banking sector. The 84th row where the 84th column element has been deleted is denoted by e; p denotes the 1×96 price vector of the 96 commodities, excluding the banking sector; and va denotes the corresponding 1×96 unit gross value added vector. The price equation can then be written as

$$p = pB + p_b e + va \tag{12.1}$$

where p_b denotes the price of the banking services. From this equation follows

$$p = p_b e(I - B)^{-1} + va(I - B)^{-1} \tag{12.2}$$

Thus, given the price of banking services that will prevail in Turkey after it adopts and implements the EU rules and regulations, p_b, the equilibrium prices of the other 96 commodities can be determined from equation 12.2, assuming that there is no change in the unit gross value added vector va. Given the equilibrium price vector p, the 1×97 price vector can be formed as $\pi = (p\ p_b)$. If CON denotes the 96×1 consumption expenditure vector obtained from the 1996 input-output table by deleting the value of consumption of the banking sector and if con_b denotes the value of consumption of banking services, the 97×1 consumption vector can be formed as

$$CONS = \begin{bmatrix} CON \\ con_b \end{bmatrix} \tag{12.3}$$

Initially, all base year prices equal unity. The value of the total consumption expenditure evaluated at the base prices of 1996 can be expressed as

$$C = u\,CONS \tag{12.4}$$

where u denotes the 1×97 unit vector. The value of the total consumption expenditure evaluated at the prices that will prevail after Turkey adopts and implements the EU rules and regulations in the banking sector is then given by

$$C^* = \pi\,CONS \tag{12.5}$$

The effect on consumer welfare[5] can now be calculated as

$$(C - C^*) \times 100/C^* \tag{12.6}$$

By construction, the prices of all commodities in the base year equal unity. The previous section revealed that adoption of the EU rules and regulations by the banking sector will decrease the net interest margin by 26.22 percent. If the value of the 26.22 percent decrease is taken as the percentage change in the price of banking services stemming from adoption of the EU rules and regulations by the banking sector, it is possible to conclude that the welfare of society will increase by 1.36 percent after adoption of the EU rules and regulations by the banking sector. The change in consumer welfare will amount to about €2.12 billion.[6]

Assuming that with the adoption of EU rules and regulations by the telecommunications, transportation, and electricity sectors prices will decline by 33.5 percent in the telecommunications sector, 8.9 percent in transport services, and 20.7 percent in the electricity sectors, a study similar to that in the banking sector reveals that adoption of the EU rules and regulations by the telecommunications, transportation, and electricity sectors will cause the welfare of society to increase in those sectors by 0.59 percent, 1.01 percent, and 0.53 percent, respectively. The effect of the adoption of EU rules and regulations by the telecommunications, transportation, and electricity sectors thus amounts, respectively, to increases of €915 million, €1.57 billion, and €822 million in the real incomes of consumers.

Table 12.7 reveals that the natural gas prices in Turkey are considerably higher than those in some EU countries, which, as was determined earlier, have adopted more advanced regulatory solutions in the sector. A weighted average of natural gas prices for the industry in Finland and the

TABLE 12.7 Retail Prices of Natural Gas and Electricity, 2000

	Natural Gas for Industry (US$/$10^7$ kcal, GCV basis)	Natural Gas for Households (US$/$10^7$ kcal, GCV basis)	Electricity for Industry (US¢/kWh)	Electricity for Households (US¢/kWh)
Austria	..	348.40	3.80	11.80
Finland	130.70	159.50	3.90	7.80
France	167.80	347.50	3.60	10.20
Germany	187.90	373.40	4.10	12.10
Greece	216.10	287.20	4.20	7.10
Ireland	145.00	345.80	4.90	10.10
Spain	175.40	491.40	4.30	11.70
U.K.	104.60	292.80	5.50	10.70
Turkey	175.20	259.60	8.00	8.50

.. Negligible.
Note: GCV = gross calorific value.
Source: International Energy Agency 2003.

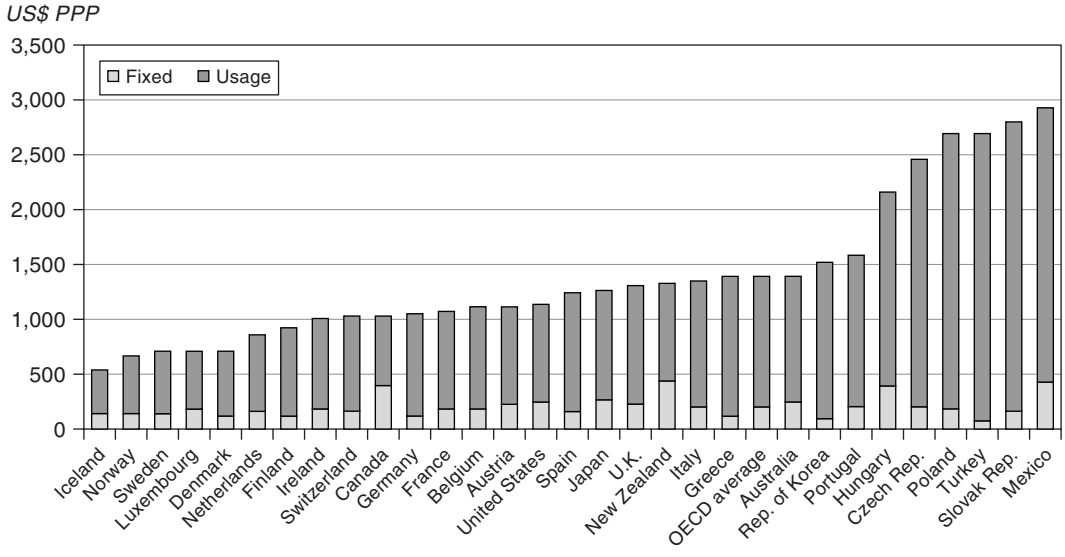
United Kingdom demonstrates that Turkish natural gas prices are 48.9 percent higher than the average price in those countries. Calculation then shows that with the adoption of EU rules and regulations by the natural gas sector, the welfare of society will increase by 0.08 percent. This change amounts to a €128 million increase in the real income of consumers.

The findings described in this section therefore reveal that Turkey will benefit from adopting EU rules and regulations in the banking, telecommunications, transportation, electricity, and natural gas sectors, and that liberalization within the context of EU integration in those sectors will lead to a 3.56 percent increase in real household incomes. This increase is equivalent to a change in consumers' welfare of €5.56 billion. During 1996, consumption was 72.95 percent of GDP, and thus the percentage change in the welfare of the society is equivalent to a 2.6 percent increase in real GDP.

Because the estimates of the price wedges caused by service barriers are the key parameters determining the welfare effects of services liberalization and liberalization in the calculations just presented, the estimates made here of tariff equivalents are compared with estimates from other sources. Figures 12.1 and 12.2 show, respectively, the telecommunications prices for business and residential customers in selected countries. By contrast, table 12.8 presents the OECD basket of international telephone charges during November 2001. The figures and the table reveal that the price wedge implicit in these figures is much larger than the figure of 33.5 percent used in the calculations made here.[7] Thus the estimates presented of the price wedge in the telecommunications sector are rather conservative, and the estimate of the effects of liberalization in telecommunications services gives the lower bound of the welfare gains derived in the sector.

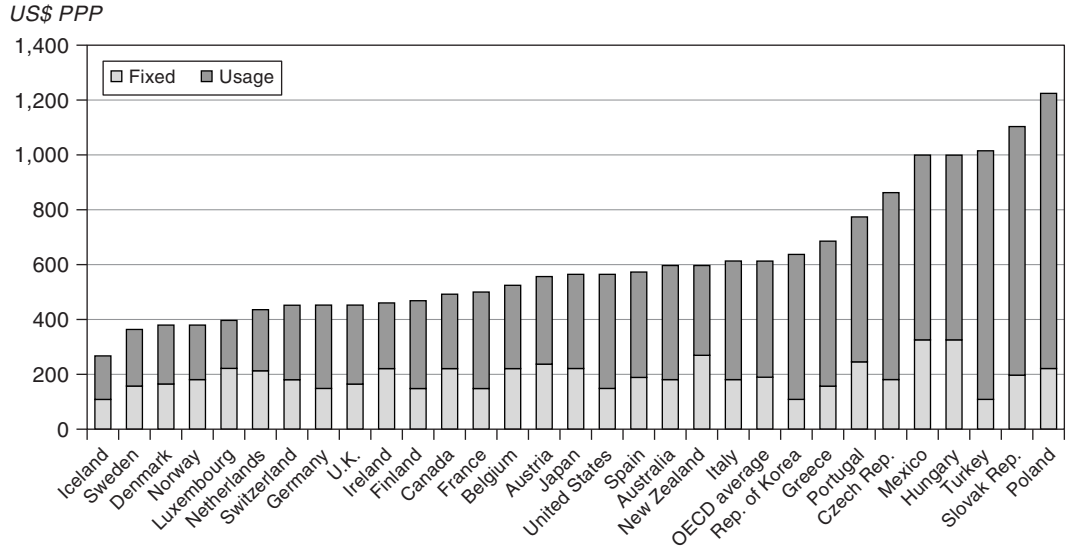
A look at the nominal prices for electricity over the period 1990–2000 in Turkey reveals that electricity prices for industrial customers have fluctuated between $.075 and $.095 per kilowatt-hour and prices for residential customers between $.045 and $.10 per kilowatt-hour. The prices for industrial consumers are almost exactly as high as those for residential consumers. Because the cost of supplying residential consumers is much higher than that of supplying industry, there seems to be cross-subsidization in favor of residential consumers. According to TEAS, the state-owned generation and transmission company, the sales prices per kilowatt-hour at the end of 1999 for industrial customers was $.0687 for high-voltage customers, $.0715 for intermediate and low-voltage customers, and in the range of $.04 per kilowatt-hour for distributors. However, the cost of producing electricity, as noted by OECD (2002), is much larger than is suggested by these data. The cost of purchasing additional electricity from BOT, BOO, and transfer of operating rights (TOOR) contract generators reaches $.11–$.12 per kilowatt-hour. Atiyas and

FIGURE 12.1 OECD Composite Telecommunications Business Basket, November 2001
(US$ PPP)



Note: VAT is excluded; calls to mobile networks and international calls are included; PPP = purchasing power parity.
Source: OECD.

FIGURE 12.2 OECD Composite Telecommunications Residential Basket, November 2001
(US$ PPP)



Note: VAT is included; calls to mobile networks and international calls are included.
Source: OECD.

Dutz point out in chapter 7 of this volume that the average cost of producing electricity will further increase over time as new BOT, BOO, and TOOR plants begin to produce electricity. Table 12.7, which presents the electricity prices in EU countries and Turkey, reveals that the electricity prices in Turkey are considerably higher than those in the EU countries where prices are the least expensive. Thus the price wedge implicit in these figures is much larger than the figure of 20.7 percent used

TABLE 12.8 OECD Basket of International Telephone Charges, November 2001

	Business, Excluding Tax		Residential, Including Tax	
	(US$)	(US$ PPP)	(US$)	(US$ PPP)
Austria	0.77	0.83	1.06	1.15
Belgium	0.49	0.56	0.57	0.66
Denmark	0.50	0.46	0.80	0.73
Finland	0.78	0.74	1.00	0.95
France	0.34	0.37	0.66	0.73
Germany	0.42	0.45	0.62	0.67
Greece	0.77	1.12	1.17	1.69
Ireland	0.51	0.55	0.70	0.76
Italy	0.90	1.16	1.32	1.69
Luxembourg	0.37	0.41	0.49	0.55
Netherlands	0.30	0.35	0.46	0.53
Portugal	0.71	1.08	0.96	1.46
Spain	0.78	1.01	1.12	1.46
Sweden	0.34	0.34	0.53	0.54
U.K.	1.18	1.16	1.61	1.58
Turkey	1.51	3.98	1.89	4.98

Note: PPP = purchasing power parity.
Source: OECD 2002.

TABLE 12.9 Estimated Tariff Equivalents in Traded Services and Network Industries

	Current Study	Hoekman (1996)	Francois (1999) and Hoekman (2000)
Financial services		9.2	46.3
Banking	31.54		
Telecommunications	33.53		
Basic telecommunications		92.9	
Value added telecommunications		42.9	

Source: The author.

here in calculations, and the estimate made here of the price wedge in the electricity sector is thus rather conservative.

Table 12.9 shows the tariff equivalents of trade barriers in traded services and network industries estimated by different authors for Turkey. Research into the measurement of services trade barriers is fairly recent, and very few studies cover Turkey. One such study was conducted by Hoekman (1996), who used information from the country schedules of the General Agreement on Trade in Services (GATS). Hoekman's estimates for Turkey are shown in the second column of table 12.9. According to the figures, the tariff equivalent in the banking sector is 9.2 percent, in the basic telecommunications sector 92.9 percent, and in the value added telecommunications sector 42.9 percent. But these estimates have, as Hoekman notes, certain drawbacks.[8] First, the method assumes that the absence of positive country commitments in the GATS schedules can be interpreted as indicating the presence of restrictions. Second, the different types of restrictions are given equal weight and are not distinguished according to their economic impact. Finally, the

method assumes that market access restrictions are the only type of barriers to trade in services.

Francois (1999) fits a gravity model to bilateral trade in services between the United States and its major trading partners, taking Hong Kong (China) and Singapore as free trade benchmarks. The independent variables are per capita income, gross domestic product, and a Western Hemisphere dummy variable. He interprets the differences between actual and predicted imports as indicative of the size of barriers to trade. These differences between actual and predicted imports are then normalized relative to the free trade benchmarks. These quantity measures also are converted into tariff equivalents by assuming a specific value of demand elasticity. Francois's estimate for Turkey, reported in Hoekman (2000) and shown in the third column of table 12.9, is 46.3 percent in financial services. Finally, a comparison of the tariff equivalents for Tunisian financial services and telecommunications sectors used by Konan and Maskus (2002) with the estimates made here of tariff equivalents reveals that the estimates used in this study are rather reasonable.

Economic Challenges

This section considers issues related to Turkey's membership in the European Economic and Monetary Union (EMU), labor markets, compliance with EU environmental directives, and state aids.

Membership in the European Economic and Monetary Union

Participation in the European Economic and Monetary Union is a must for Turkey, because the *acquis* is expected to be adopted in full, including EMU participation, as well as, in due time, all the requisite "Maastricht criteria" for Euro Area integration. Turkey is not expected to adopt the euro immediately upon accession. According to Article 122 of the Treaty Establishing the European Community, upon accession Turkey will be treated as a "country with a derogation" until it fulfills the convergence criteria, which involve conditions on price stability, interest rate convergence, the budget deficit, the government debt, and exchange rate stability.

As emphasized by the European Commission (2003), during the preaccession period Turkey must adopt the required EMU legislation in order to acquire the status of "Member State with a derogation" for adoption of the euro. In particular, Turkey needs to take the relevant steps to liberalize capital movements completely, prohibit the privileged access of financial institutions to the public sector, and attain the political and economic independence of the monetary authorities. Upon accession, the common macroeconomic policy framework will become more constraining, with strong reinforcement of fiscal discipline and the integration of other economic policies. Budgetary policy and outcomes will become subject to the excessive deficit procedure and the nonpunitive parts of the Stability and Growth Pact (SGP). The Maastricht Treaty specifies that the country will have to progress toward fulfillment of the Maastricht criteria, and under the conditions of the SGP it will have to endeavor to avoid excessive deficits. Furthermore, exchange rate policy will become a matter of common interest. Finally, adoption of the euro will require Turkey to become part of the single, stability-oriented monetary policy and of the ensuing single exchange rate policy. Furthermore, Turkey will become subject to the sanction parts of the SGP. Once Turkey adopts the euro, it will replace its domestic currency with the euro at an irrevocably fixed exchange rate, transfer the bulk of its reserves to the European Central Bank, and agree to be bound by the SGP.

In addition to the legislative changes just described and thorough implementation of this legislation, Turkey will face the problem of attaining over time sustainable development while simultaneously satisfying the Maastricht criteria. The country realizes that, in the long run, price stability and fiscal discipline create the best conditions for sustained, robust economic growth. But the current situation is problematic. Turkey is not satisfying the Maastricht conditions. In 2003 the inflation rate was 25.3 percent compared with 2.7 percent, the reference value for inflation in the EU; public sector borrowing requirements as a percentage of GDP were 8.8 percent compared with 3 percent, the reference value of the budget deficit in the EU; the debt-to-GDP ratio was 80.3 percent compared with 60 percent, the reference value of the debt-to-GDP ratio in the EU; and the average interest rate was 28.5 percent compared with 6.2 percent, the reference value of long-term interest rates in the EU. But as of the

end of 2004, the annual inflation rate had been reduced to 9.2 percent, and the average interest rate on government debt during December 2004 to 19.8 percent. During 2004, the growth rate of GDP is expected to be more than 8 percent, and the unemployment rate as of the second quarter of 2004 had been reduced to 9.3 percent. Although these are all positive developments, the annual current account deficit during 2004 amounted to $15.6 billion, and the annual current account deficit-to-GDP ratio for 2004 is expected to exceed 5 percent.

The challenge facing Turkey is how to move from the current state of affairs to a state in which the Maastricht criteria are satisfied. According to Togan and Ersel in chapter 1 of this volume, the following issues are facing Turkey:

- Although the country has reduced the inflation rate considerably through strict implementation of the International Monetary Fund (IMF) economic program, the reduction was achieved partially through decreases in the cost of imported goods stemming from real appreciation of the Turkish lira. But reducing the inflation rate through real appreciation of the currency is not sustainable in the long run, because such a measure will lead to problems of sustainability of the current account.
- Although the country has reduced the debt-to-GDP ratio substantially during the last few years by running primary surpluses amounting to 6.3 percent, such as during 2003, the reduction was achieved partially through real appreciation of the currency. However, reducing the debt-to-GDP ratio by this means is not sustainable in the long run.
- Because the debt-to-GDP ratio can be reduced over time by achieving surpluses of government revenues over noninterest expenditures amounting to at least 6.5 percent of GDP, the government will be constrained in its use of fiscal policy to decrease the unemployment rate in the economy, which in 2004 was still 9.3 percent. The constraint may have political implications.
- A close look at the issues related to the sustainability of the current account reveals that the choice of exchange rate policy during the preaccession period will be of prime importance for Turkey. The policy of real exchange rate appreciation pursued during the last two years is not sustainable in the long run under rather realistic values of foreign real interest rates. Sustainability of the current account requires depreciation of the real exchange rate over time to its long-run equilibrium value.

Labor Markets

In chapter 9 of this volume, Taymaz and Özler describe the flexibility of the Turkish labor market, which stems primarily from the fact that the labor market is not homogeneous. It has different wage-setting mechanisms in its formal and informal sectors. The informal sector is largely free from most types of labor regulation and pays few taxes and related charges. Activities in this sector rely mostly on the provision of labor services without formal employment contracts. Job insecurity is pervasive, and workers receive very few benefits from their employers. By contrast, the formal sector observes labor regulations and pays all taxes and related charges such as social security contributions and payments to various funds. According to various studies, the share of the informal sector of total employment is about 60 percent.[9] The reasons for the relatively high share of the informal sector in total employment are (1) the very high tax rates on wage income, the high tax-related charges, and the substantial payments to various funds that must be paid by those working in the formal sector to comply with the social security law and the laws regulating the taxation of personal incomes; (2) the relatively high firing costs imposed by the labor law and the stringency of the various clauses of the labor law; and (3) the lack of enforcement mechanisms for the respective laws in the economy.

The population of Turkey increases on average at a rate of 1 million persons per year, and thus the country must continually create new jobs to accommodate this growth. In addition, Turkey must create jobs for those unemployed and must increase the labor force participation rate from its low level of 48.3 percent. In the past, Turkey successfully managed the unemployment problem through its large, flexible informal sector where wages are free to equilibrate demand and supply and through labor migration from Turkey.

With its accession to the EU, Turkey will have to enforce the rule of law uniformly in the country. It can no longer tolerate the lack of enforcement mechanisms for different laws and regulations in the economy. Yet such a shift will have to occur

without increasing Turkey's unemployment rate. Taymaz and Özler estimate that when all manufacturing firms in the informal sector begin to pay taxes and social security contributions at the same rates as in the formal sector and when informal sector firms lose half of their market shares because of the change, employment in the manufacturing sector will decline by 8.9 percent. Thus about 300,000 jobs will be lost. But the effect of the policy change on employment—when all informal sector firms in all sectors of the economy begin to pay taxes and social security contributions at the same rates as in the formal sector—will actually be much more drastic, because the effects on employment in the agricultural and services sectors must be considered as well. In the end, the number of jobs lost will far exceed the 300,000 estimated by Taymaz and Özler. Thus to avoid an increase in unemployment the country must introduce comprehensive labor market reform. Such a reform will probably entail substantial decreases in the tax rates on wage income, tax-related charges and payments to various funds, decreases in the firing costs, and changes in various clauses of the labor law so they are less stringent.

Complying with EU Environmental Legislation

To join the EU, Turkey must adopt and implement the entire body of EU legislation and standards on environmental protection. Bringing its environmental protection system, infrastructure, and standards up to Western European levels will require, in turn, substantial investments by the public and private sectors as well as changes in regulations and supporting institutions.

Within the EU regulations on wastewater collection and treatment, the urban wastewater directive (91/271/EEC) requires all urban areas with a total wastewater discharge of 2,000 population equivalent to be connected to the sewer system, and the discharges of sewers must receive at least secondary treatment. The directive allows exceptions for towns with a population of less than 10,000 when sewers would produce no environmental benefit or would involve excessive cost.

In 1997 the population of Turkey was 62.87 million. Of this number, 13.75 million were living in areas with a population of 2,000 or less, 49.12 million in areas with more than 2,000, 22.57 million in areas with 10,000 and less, and 40.3 million in areas with more than 10,000. In 1997 there were 2,835 municipalities with a total population of 48.2 million; 7.3 million people were living in rural municipalities. According to the State Planning Organization, 72 percent of the people living in municipalities were not connected to sewage treatment. For an additional 23 percent of population, sewer systems were under construction. Upon the completion of these systems, 51 percent of the population living in municipalities (24.5 million out of 48.2 million) will be connected to sewer systems, leaving 23.7 million with no connection. Two percent of municipalities have wastewater treatment facilities and 14 percent of people living in villages have a sewer connection with septic tanks, but 11.8 million people have no sewer connection.

The costs of meeting sewer needs will depend on three parameters: (1) the proportion of the rural population living in towns that would be classified as agglomerations with a population of more than 2,000 population equivalent; (2) the proportion of towns with between 2,000 and 10,000 population that will be exempted from constructing sewer systems on the grounds of no environmental benefit or excessive costs; and (3) the proportion of rural population that must have sewers. Once the European Commission and Turkey agree on these parameters during the negotiations, the cost of compliance with the EU directive would be determined. The investment cost of complying with the directive has been roughly estimated at more than $10 billion. Adding the additional operations, maintenance, and replacement costs would increase this cost even further.

Environmental protection will therefore present challenges for Turkey. The costs will be substantial when, in addition to the costs of complying with EU regulations on wastewater collection and treatment, the costs of complying with those on drinking water, industrial pollution, dangerous chemicals, fuel standards, air quality, and waste management are considered. In chapter 11 of this volume, Markandya estimates that the total cost would be between €28 billion and €49 billion. But he notes that because the outlay will be over a long period (about 17 years), the annual amount will be more manageable. Furthermore, he finds that annual investments would amount to around €2 billion to €3 billion in the "fast reform" (low-cost) case and €3 billion to €5 billion in the slow reform (high-cost) case. In the initial years,

this investment would amount to 1–1.5 percent of GDP in the low-cost case and 1.5–2.5 percent of GDP in the high-cost case. The extra annual operating costs also incurred would range from €5 to €8 billion. Markandya reports that OECD has estimated Turkey's capital spending on the environment at about 0.5 percent of GDP. Thus with accession, this spending would have to double, or more likely increase by a factor of three or four. In addition, a much higher level of current spending would be required. These costs, although substantial by any standards, could be considered the price for joining the EU. One could also argue that these investments would have been made in any case by Turkey. Only the timing of the investments would be different, because EU directives may not correspond to Turkey's priorities at this stage of its development.

State Aid

During the 1980s, Turkey used three tools of industrial policy intensively: investment incentives, export incentives, and policy on state-owned enterprises. In each case, the government tried to obtain a preferred allocation of resources through the use of subsidies. The investment incentives, regulated by laws and decrees, have been directed toward reducing the cost of investment, reducing the need for external financing, and increasing profitability. On the export side, the government's use of various types of export incentives during the 1980s increased the profitability of export activities. As for the policy on state-owned enterprises in Turkey, the Turkish public enterprise sector has been and still is very large. The state-owned enterprises have in general exhibited poor economic performance because of the soft-budget constraints they have faced. Public enterprises are not subject to commercial code and, as such, they escape bankruptcy laws. Moreover, they receive subsidies from the government in the form of direct transfers, equity injections, and debt consolidation.

Recently, Turkey eliminated most of the investment and export incentives. Within this context, General Agreement on Tariffs and Trade (GATT) legal subsidies (e.g., research and development subsidies and subsidies to facilitate the adaptation of plants to new environmental regulations) have been introduced. Export subsidies in Turkey are restricted to those given to research and development activities and environmental projects and to export promotion activities. Although considerable progress has been achieved in the fields of investment and export incentives, similar progress has not been possible for public enterprises. Privatization has become a prominent part of the Turkish structural adjustment program since 1983, but it did not gain momentum until very recently. Turkey recognizes that it will have to stop subsidizing its public enterprises at the prevailing rates and that it will have to take steps to align its state aid policies with those of the EU, to apply the same competition policies to all firms whether private or public, and to privatize public enterprises.[10]

Growth Effects

The preceding discussion of the welfare effects of accession reveals that Turkey's integration within the EU will remove the distortions in the country's price system, which, in turn, will boost allocative efficiency within the economy. The heightened efficiency also will make the country a better place in which to invest. Investment will therefore increase, as will foreign direct investment. Thus the allocative efficiency gains from integration will be boosted by induced capital formation. When investment rises above its normal level, the Turkish economy will experience a growth effect. All this means improved material well-being for the Turkish people in the long term.

The growth effects of accession will be studied here by first forecasting the volume of trade between Turkey and the EU15, under the assumption that it will reach the same level of intensity as the present trade between the EU member states. The forecast is then used to study the growth effects of accession.

The forecast of the volume of trade between Turkey and the EU is based on estimation of a gravity function for trade within the EU15. The gravity function, which has been used to explain the volume of bilateral international trade since the 1960s, has proved remarkably successful. It postulates that the volume of trade between a pair of countries is a function of (1) the size of the trading partners, measured by GDP, population, or geographic area; (2) their income level or capital abundance, measured by GDP per capita; and (3) trade costs, measured by a variety of factors such as tariffs and other administratively imposed trade barriers,

TABLE 12.10 Gravity Estimates for Intra-EU15 Trade

	Estimate
Constant	−3.884133 (−3.193833)
ln real product GDP	0.815026 52.1816
ln real product GDP per capita	−0.145238 (−2.705978)
ln distance	−0.901144 (−21.50092)
R-squared	0.622767

Source: The author.

geographic distance, common borders, common language, or common legal systems. The following standard version of the gravity function was estimated:

(12.7) $\ln$ [(exports from country i to country j + exports from country j to country i)/2] = constant + $\beta_1 \ln$ (GDP of country i × GDP of country j) + $\beta_2 \ln$ (GDP per capita of country i × GDP per capita of country j) + $\beta_3 \ln$ (geographic distance) + error term.

The dependent variable in the gravity equation is the logarithmic average of bilateral exports. It is explained by the logarithmic product of GDP; the volume of trade is simply assumed to rise in proportion to the combined economic size of the trade partners. GDP per capita can be thought of as a measure of product differentiation and specialization. The higher the per capita income, the more differentiated are taste and production and the larger is the volume of trade based on product differentiation and increasing returns to scale. A high per capita income is also an indication of abundant physical and human capital relative to manual labor. Thus the per capita variable should serve to capture both the intraindustry trade produced by product differentiation and the increasing returns to scale and interindustry trade produced by differences in factor endowments. Trade costs are controlled by the inclusion of geographic distance, which is an indicator of transportation costs, but also of the costs of cultural differences, which tend to increase with geographic distance.

The estimates of the gravity equation are presented in table 12.10. The equation explains more than 90 percent of the variation in the data. All coefficients are estimated with a very high level of statistical significance (less than 1 percent) and have the expected sign, with one exception. The product of real per capita GDP is found to have an unexpected *negative* effect on the volume of trade. The estimate of the gravity equation is then used to make forecasts of bilateral trade for Turkey with the EU15. The forecasted value of Turkish–EU15 trade for 2000 is $25.75 billion, which is almost 25.2 percent higher than the actual average value of $18.55 billion for the period 1999–2001. For that period, the average of Turkish exports to the EU was $14.99 billion and of imports from the EU $22.1 billion.

Next, it is assumed that Turkey eventually will have a share of EU trade to total trade that is equal to that of the four largest EU countries—58 percent. Then, the total trade of Turkey will increase to $44.4 billion. When this value is divided by the average value of GDP for the period 1999–2001, it produces a ratio between the average of exports and imports to GDP of 25.2 percent. The actual value of total trade to GDP over the 1999–2001 period is, by contrast, 20.67 percent. Noting the assertion by Frankel and Rose (2002) that every percent increase in the country's overall trade relative to GDP raises income per capita by at least one-third of a percent, one then finds that, with EU accession, per capita income in Turkey will increase by about 1.5 percent.

Conclusion

To join the EU, Turkey must attain macroeconomic stability, adopt the EU's Common Agricultural Policy, and liberalize its services and also its network industries. Integration will be beneficial for Turkey, because it will remove the distortions in the price system, thereby boosting allocative efficiency within the economy, which, in turn, will make the country a better place to invest. Furthermore, with accession Turkey will be eligible for EU structural funds. The increase in infrastructural investments will contribute to economic growth in Turkey. Turkey will also reap benefits from monetary integration.

The welfare gains derived by Turkey from integration will, however, have a price. The price will be

the adjustment costs associated with the attainment of macroeconomic stability, adoption of the CAP, adoption of the EU's labor market rules and regulations, and compliance with EU environmental directives.

Notes

1. All dollar amounts are U.S. dollars unless otherwise indicated.

2. Cabotage refers to the carriage of freight within a country or between two countries by a carrier that is from neither country.

3. Polo and Scarpa (2003) consider it more appropriate that an independent regulatory authority devoted to the liberalization of the industry fill the delicate role of arbitrator rather than a ministry, which is typically responsible for a broader range of political objectives.

4. Although in both cases the regulator has the final word on the access conditions, Polo and Scarpa (2003) argue that the ex ante regime, requiring the regulator to act as a first mover, forces it to reach a better solution.

5. This approach determines the equivalent variation in consumer income.

6. When considering the welfare effects of integration, I abstract from explicit consideration of problems of implementation and assume that once the *acquis* is adopted liberalization of the sector will be achieved. This is a simplification introduced in the analysis.

7. The implicit price wedge is derived from the relation $p = p^* (1 + t)$, where p refers to the Turkish price p^*, the best practice price in the EU, and t is the price wedge parameter.

8. See Stern (2002) and Whalley (2004) for further discussion of the state of knowledge on barriers to trade in services and the robustness of existing empirical research in this area.

9. Taymaz and Özler report that the share of the informal sector in manufacturing is 40 percent. Its share is much higher, however, in the agricultural and services sectors.

10. Turkish competition law is silent on the subject of public undertakings. It does not contain a clause like Article 86 (ex Article 90) of the Treaty Establishing the European Community, which explicitly brings public undertakings within the scope of competition policy. Recently, state aid in Turkey has taken the form of injections to private banks under the management of Savings Deposit Insurance Fund (SDIF). These banks are largely those hit by capital losses during the November 2000 and February 2001 crises. The capital losses stemmed from the sharp decline in the market value of government securities holdings and the sharp increase in the foreign exchange rate. According to EU regulations, state aid to the banking sector is subject to the same conditions as any other state aid and as such it should be avoided.

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