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Competitiveness of the Turkish Economy: Average Man Trap

Türkiye Ekonomisinin Rekabetçilik Düzeyi: Ortalama İnsan Tuzağı

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Abstract

Turkey belongs to the world's largest 20 economies and distinguishes from other developing and Islamic countries with its well-educated population, modernity, reconciliation of traditional life and modern life, democratic formation and performance and the economic and civil liberties.

However, Turkey has still not overcome middle-income or middle technology trap. In this essay, we recommend to use the concept of "average man trap." In developing countries, the formation of human resources is also in the development stage. Therefore, closing the gap between developed and developing countries necessitates relatively more rapid development rates. Since focusing directly on effects of human resources on income and technology, we argue that "average man trap" is most explanatory factor for developmental issues.

Turkey is located between the countries belong to efficiency driven group and the countries belong to innovation -driven group. We argue that without abandoning "average man model" in the decision making and administrative spheres Turkey will suffer from this trap. When the education investments and internationalization of skilled labor trends are taken into account, Turkey would break its shell in 2025, ten years later than now. Since Turkey has a century and half length long term relationship with the Western Block, our ten year prediction would even be longer due to the historical poor performance.

Universities and vocational higher schools are functioning in every corner of the country today, we anticipate that this trend would rapidly improve human resources. Because the current human resources engaging in decision-making mechanisms are not ready to feel confident to delegate their authorities. The fear is losing control of the decision making and business. The socio-political and socio-economic backgrounds of the present managing groups are not very confident to face with higher classes. Therefore, the country will wait until the prospective educated children of the managing classes for taking the authority and delegating the duties and participating more talented personnel to the decision making processes without feeling a threat or complexity.

Keywords: *Middle Income Trap, Average Man Trap, Competition, Turkish Economy*

Öz

Türkiye dünyanın en büyük 20 ekonomisi arasında olup, eğitimli nüfusu, modernliği, geleneksel yaşamla çağdaş yaşamı uzlaştırma yönündeki başarısı, demokratik formasyonu ve performansı ve ekonomik ve sivil özgürlükler bakımından özel bir yere sahip olmasına rağmen, hala, orta gelir veya orta teknoloji tuzağını aşamamıştır. Biz bu incelemede "ortalama insan tuzağı" kavramının kullanımını öneriyoruz. Gelişmekte olan ülkelerde insan kaynakları formasyonu da gelişme aşamasındadır. Bu nedenle gelişmiş ülkelerle arasındaki farkı kapatması ancak göreli olarak daha hızlı gelişme kaydetmesinde yatar. Gelir veya teknolojinin doğrudan belirleyicisi olarak insanı odağa koyduğu için "ortalama insan tuzağı" yaklaşımının açıklayıcı faktör olarak yeterli olduğunu düşünüyoruz.

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Türkiye hala faktör etkinliği grubundaki ülkelerle yenilik üreten gruptaki ülkeler arasında bir yerde konuşlanmış ve buradan da yaklaşık on yıldır kurtulamıyor. Bizim tezimiz, Türkiye'nin karar alma ve yönetsel mekanizmalarda "ortalama insan" modelini kullanmaya devam ettikçe bu tuzaktan kurtulamayacağıdır. Öngörümüz, en az 10 yıllık bir süre sonunda Türkiye'nin bu açmazı aşabileceği yönündedir. Türkiye'nin birbuçuk asırdır Batı ile çok yakın politik ve ekonomik angajmanı ve buna rağmen nispeten düşük performansı dikkate alındığında, bu sürenin biraz daha uzayabileceği de söylenebilir. Ancak, bugün ülkenin her köşesinde açılan yüksek öğrenim ve mesleki eğitim kurumlarının insan kaynağını hızla iyileştireceğini öngörüyoruz.

Halihazırda karar alma mekanizmalarında bulunanların eğitim düzeyi ve ait oldukları sosyopolitik ve sosyoekonomik arkaplanlar itibariyle ortalamanın üstünde vasıflı insanları karar alma ve yönetim noktalarına yerleştirmelerini beklemek çok da rasyonel görünmüyor. Çünkü, görece daha yüksek nitelikli bu kişilerle baş edememe, kontrol edememe, yönetememe ve aldatılma riski kısır döngünün kendisini sürdürmesini de meşrulaştırmaktadır. Gücü elinde bulunduranların eğitimli ve daha kentli çocuklarının işleri devralması durumunda, Türkiye "ortalama insan" modeline bağlı olmaya gerek duymayacaktır. Dolayısıyla, bugün yürürlükte olan karar alma mercilerindeki ortalama vasıftaki insanların performansları da beklendiği gibi ancak ortalama civarında seyretmektedir. Türkiye'nin çıkar yolu ortalamayı yükseltmekten geçiyor.

Anahtar Kelimeler: *Orta Gelir Tuzağı, Ortalama İnsan Tuzağı, Rekabet, Türkiye Ekonomisi*

Introduction

This study aims to address the current position of competitiveness of the Turkish economy. The competition performance of Turkey will be assessed in national and international contexts. The determinants of the level of competition and capacity of creating innovation will follow this section. The following section will examine property rights, innovation capacity and R&D studies and finally sectoral competitiveness of the Turkish economy will be examined in the last section.

Turkey is the 17th largest economy in the world in terms of the size of its economy in 2012, and provides 1.1% of the world production. However, there is a huge gap between the level of competitiveness and the size of the economy. As the 17th biggest economy, Turkey doesn't show a parallel performance in terms of global competitiveness and ranks 44th among 144 countries. In global competition, Turkey is placed relatively behind, and in the national dimension it doesn't have an equitable or relatively homogeneous regional competitiveness. By the regions of Turkey, the ratio of the highest competitiveness score to the lowest one is 3.1. In addition, not only are there discrepancies in socioeconomic development levels among regions but also income distribution is deeply unequal.

According to the World Bank calculations, Turkey's ease of doing business rank is 71st in 185 countries. In terms of international property rights index Turkey ranks 65th in 130 countries. Relatively poor performance of Turkey in the quality of education sector and in the flexibility of the labour market pushes it to a more disadvantageous position.

The appearance of the issues such as economic freedoms, perception of corruption and political / civil liberties is parallel to the table mentioned above. Another subject of great importance in terms of competition is patent applications. In this area, the share of Turkey is around 0.3 percent in the world.

Another indicator that has an important effect on competitiveness is innovation capacity. Turkey is situated with Bulgaria and Latvia with the lowest innovation capacity in Europe. Naturally, low level of R&D expenditures lies behind the insufficient innovation capacity. Indeed, while the world average of the share of R & D activities in the national income is 1.7%, this ratio ranges from 2.5 to 3% in developed countries. The share of R&D activities in Turkey is around half of the world average (0.86%).

The level of competition has impacts on monopolization and efficiency levels. Indeed, relatively more concentrated sectors face less efficiency and lower added values. On the other hand, the sectors which are relatively more competitive have higher added values and higher efficiencies. According to 2010 data, concentration ratios of 127 classes are very high and of 73 classes are high. CR4 of 86 classes is regarded as medium and of 229 is regarded as low.

The most striking results of an analysis conducted by the Turkish Development Bank indicate that Turkish manufacturing industry is facing a "medium technology trap." High price elasticity of foreign demand for Turkish export goods, the low level of innovation-based exports, and relatively high performances of traditional industries don't imply a bright table when comparing with innovation economies of the developed markets.

In fact, the share of exports of high-tech sectors in the manufacturing industry is calculated as 3.7% in 2012, and estimated to be 5.5% in 2018. It could be said that the performance of Turkey is pretty low in terms of middle income trap or more accurately middle technology trap.

Competition: Domestic and International Performance of Turkey

When determining competition levels of national economies, a general criterion is the competition levels among countries, not the competition between firms in a country. However, competition level of a country goes parallel with the performance of private sector. The strength of the Turkish economy is rooted in the competitive nature of the firms.

The more competitive a private sector the more consolidated its strength. Several studies have shown that political and civil freedoms are preparatory conditions for economic development. On the other hand, economic freedoms are complementary to the political and civil freedoms. The higher scores of political, civil and economic freedoms of a country indicate the higher economic performance both nationally and per capita it has.

The private sector gets stronger as it becomes more competitive. There have been many studies in the literature that relate political and civil liberties to economic development. Economic liberties support political and civic liberties. If a country has higher scores in terms of political, civil and economic liberties, economic performance and wealth would be higher.

The World Economic Forum (WEF) classifies the factors that determine competitiveness under twelve categories. They can be expressed as follows: Institutions, infrastructure, macroeconomic environment, health and primary education, higher education and vocational training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, business sophistication and innovation.

Political and Civil Liberties

Before looking at the competition level of the Turkish economy it would be better to depict its position in terms of political and civil liberties. There is an enormous literature on how economic development goes hand in hand with political and civil liberties. The measurements of Freedom House, the Fraser Institute, the Heritage Foundation, Transparency International, the United Nations Development Programme, the World Economic Forum, Maastricht University School of IMD, World Bank, the World Property Organization and OECD indicate that Turkey's position situated at the bottom of the league of the developed countries. Developed countries are classified in "free" class, while Turkey is listed "partly free." Turkey's performance of political and civil liberties are pretty poor comparing to the size of the national income.

In recent years, in spite of taking important steps in political and civil liberties for the general public, several coup d'ětat attempts, ethnic-based terror conflicts, the problems occurred during law enforcement and misusing of security forces and the judiciary have made it difficult to move forward in human rights and freedoms.

Another important thing for the development of freedoms and competition is transparency. According to the Transparency International's report of 2012 the perception of corruption in Turkey ranks 61st in 182 countries. Turkey's poverty score is 4.2 points out of 10. Namely, Turkey's score has a value less than half of the ideal points.

Economic Liberties, Property Rights, Growth and Competitiveness in Education

An increase in competitiveness depends on political and civil liberties as well as economic freedoms. In the absence of economic freedoms, competition can't flourish. Turkey's position of economic freedoms is not brighter than its appearance of political and civil liberties. According to the Heritage Foundation's 2012 report Turkey ranks 74th out of 184 countries. Turkey's economic freedom score is 62.5 out of a full score of 100.

Turkey's performance of human development is situated among upper-middle class countries. However, when comparing to the developed economies, level of human development is still very low. The UN Development Report findings show that Turkey ranks 92nd out of 187 countries. Human development score of Turkey is 699 over 1000 points. Turkey's human development performance is a little over half of the ideal values. Another factor that has impact on the level of competition is the ease of doing business. The World Bank (2012) finds that Turkey's rank of ease of doing business is 71st in 183 countries.

Considering Turkey's long-term economic relations with the West and the relatively higher size of its national economy as the 20th biggest economy in the world, there is a need to consider the handicaps that the country has still failed to meet the structural problems in doing business. The issue of property rights is crucially important for economic freedom and competition. With regard to protecting property rights, the appearance of Turkey is weak.

Compose of legal and political environment, physical property rights and intellectual property rights, property rights index is 5.3 out of 10 points for Turkey. According to International Property Rights Index (IPRI, 2012), the rank of Turkey is 65th out of 130 countries. Finland's score ranks the 1st (i.e. 8.6 points).

Qualified human resources are a prerequisite for development of competition and economic and political freedoms. Another serious deficit in terms of human resources Turkey encounters is low quality in primary and secondary education. Turkey ranks the lowest in the OECD PISA tests. Considering all these indicators together, it can easily be said that Turkey has been caught in the middle technology trap, the middle income trap or more accurately middle-skilled human resources trap.

Table 1. Economic, Political and Civil Freedoms

	Research field	Highest or reference value	Rank of point of Turkey	Relative position
Freedom House (2013)	Political rights and civil freedoms	(fully) Free	Partly free	In 209 countries / territories
Fraser Institute (2010) (10: Free, 1: repressed)	Economic freedom	10	6,92	75th in 144 countries
Heritage Foundation (2012) (100: free, 0: repressed)	Economic freedom	100	62,5	74th in 184 countries
Transparency International (2012) (10: no corruption, 1: corrupted)	Perception of corruption	10	4,2	61st in 182 countries
UN Development Program (2011) (1: most developed, 0: undeveloped)	Human development	1	0,699	92nd in 187 countries
World Economy Forum (2012/2013) (7: most competitive, 1: least competitive)	Global competition	7	4,45	43rd in 144 countries
World Competition Yearbook (2012) Institute for Management Development (100: most competitive, 0:not competitive	Global competition	100	38 (62,24)	48th in 59 countries
World Competition Yearbook (2012) Institute for Management Development (100: most competitive, 0:not competitive	Competition in education	100	45,96 (2010: Iceland 1st; 72,19)	51st in 59 countries
World Bank (June 2012)* (1: doing business is easy, 183: doing business is difficult)	Ease of doing business	1	71	71st in 185 countries
International Property Rights Index (IPRI, 2012) (1: most protected, 10: least protected)	Property rights (legal and political environment; physical property rights, intellectual property rights)	10	5,3 (Finland; rank: 1st; points: 8,6)	65th in 130 countries
OECD (2010) (Programme for International Student Assessment) PISA (15 years 3 months-16 years 2 months) (OECD changes between 400-600)	Verbal-Mathematics-Science South Korea; V:539, M:546, S:538 Finland-V:536,M:541,S:554	600 OECD average: V:493, M:496, S:501	V.464, M:445, S:454	32nd in 34 OECD members (same as Mexico and Chile)

The Most Important Challenges in Front of Doing Business

Obstacles before doing business are a key element that affects competitiveness. According to the findings of the World Economic Forum (2012), the most important obstacles before doing business in Turkey are listed as follows: Tax rates (15.4%), deficiencies in the state bureaucracy (14.0%), tax regulations (10.3%), inadequately educated workforce (9.6%), foreign exchange regime (8.7%), access to financial resources (7.9%), restrictive labour regulations (7.8%), inadequate infrastructure delivery (7%, 7), political instability (7.3%), poor work ethics in the labour market (4.6%), corruption (2.5%), poor public health (1.5%), government instability / corruption (1.3%), inflation (1.2%), and crime and theft (0.3%). It can be said that Turkey's bottlenecks in this field are high tax rates, inefficient state bureaucracy and shortage of qualified labour force, insufficient domestic savings, and costly labour regulations.

Determinants of Competitiveness and Innovation Performance of Countries

Determinants of competitiveness

Structural and behavioural factors used by the World Economic Forum show that the competitiveness of Turkey's position is not satisfactory and areas for improvement are clarified. These factors are also determinative on the level and sustainability of competitiveness. Accordingly, in the framework of sustainable competitiveness index five main categories of factors are extracted. They can be expressed as human capital, market conditions, technology and innovation, political and physical environment. The major categories can be expressed in more detail as follows (WEF, 2012):

- "Institutions": the factors under this parameter are property rights, intellectual property protection, the diversity of public funds, trust in politicians, unregulated payments and corruption, judicial independence, favouritism in decisions of government officials, government spending, public regulatory burden, the effectiveness of the legal framework of resolving disputes, efficiency of regulatory framework in overlapping regulations, transparency in public policy settings, delivery of public services for more effective business world, cost of terrorism to the business world, cost of crime and violence to the business world, organized crimes, trust in police services, level of ethical behaviour of companies, public oversight and strength of reporting standards, the efficacy of corporate boards, the protection of minority shareholders in the company, and the level of investor protection.

- "Infrastructure": the variables under this category are grouped as the quality of the infrastructure as a whole, namely the quality of roads, rail infrastructure, and port infrastructure, the quality of transport infrastructure, airline passenger capacity per capita of population, the quality of electricity supply, the prevalence of mobile phone subscription, landline telephone line size.

- "Macroeconomic environment": The factors grouped under this category are the ratio of state budget to GDP, ratio of public debt to GDP, savings rate, inflation rate, and the country's credit rating.

- "Health and primary education": Main factors under this category are the effect of plague on the business world, the prevalence of the plague, tuberculosis prevalence, the prevalence of AIDS in the adult population, early child mortality, life expectancy, quality of primary education, and primary school enrolment rate.

- "Higher education and vocational training": Main factors under this parameter are listed as high school enrolment rates, university enrolment rates, the quality of the education system, the quality of math and science education, the quality of business schools, internet access in schools, access to R&D education services, and coverage of personnel training.

- "Goods market efficiency": The primary variables in this category are the intensity of local competition, the scope of market dominance, efficacy of the anti- monopoly policy, the scope and effect of taxation, the total tax rate for profits, the number of procedures for starting for a business, the number of days spent in opening a business, the cost of agricultural policy, the prevalence of barriers to foreign trade, foreign trade tariffs rates, the prevalence of non-residents' pro-

perty, the effect of regulations for foreign direct investment on the business world, the burden of customs procedures, the ratio of imports to GDP, the degree of customer orientation, and sophistication of purchasers.

- "Labour market efficiency": The following factors are listed under this category; the employee-employer relations, flexibility in determining wages, hiring and firing practices, unnecessary costs and weekly wages, payment and productivity, level of professional management, the brain drain, and the female labour force participation rate.

- "Level of development of financial markets": The main variables under this parameter are access to financial services, the level of meeting the cost of financial services, level of financing through local equity market, ease of access to lendable funds, the presence of venture capital, soundness of banks, the arrangements for securities, and legal rights index.

- "Technological readiness": The factors under this group are availability of newest technologies, the degree of technology absorption at firm level, foreign direct investment and technology transfer, the ratio of the use the internet at individual level, broadband internet subscriptions, international Internet bandwidth per user, and the mobile broadband subscription.

- "Market size": Under this heading, the size of the domestic market and foreign market size index are covered.

- "The level of development of the business world": This category focuses on quality and quantity of production. The main factors in this group are listed as the number and quality of local suppliers, the development level of clusters, the nature of competitive advantage, value chain width, control of international distribution, sophistication of production process, scope of marketing, and eagerness to delegate authority.

- "Innovation": The primary variables under this category are innovation capacity, quality of scientific research institutions, the corporate sector R&D expenditure, R&D of university- industry collaboration, the level of government procurement of advanced technology products, the availability of scientists and engineers, the patents and applications under the Patent Cooperation Treaty.

Taking the above factors and components into consideration, innovation, technological readiness, labour market efficiency, higher education and vocational training, and basic education are the areas that need to be developed urgently.

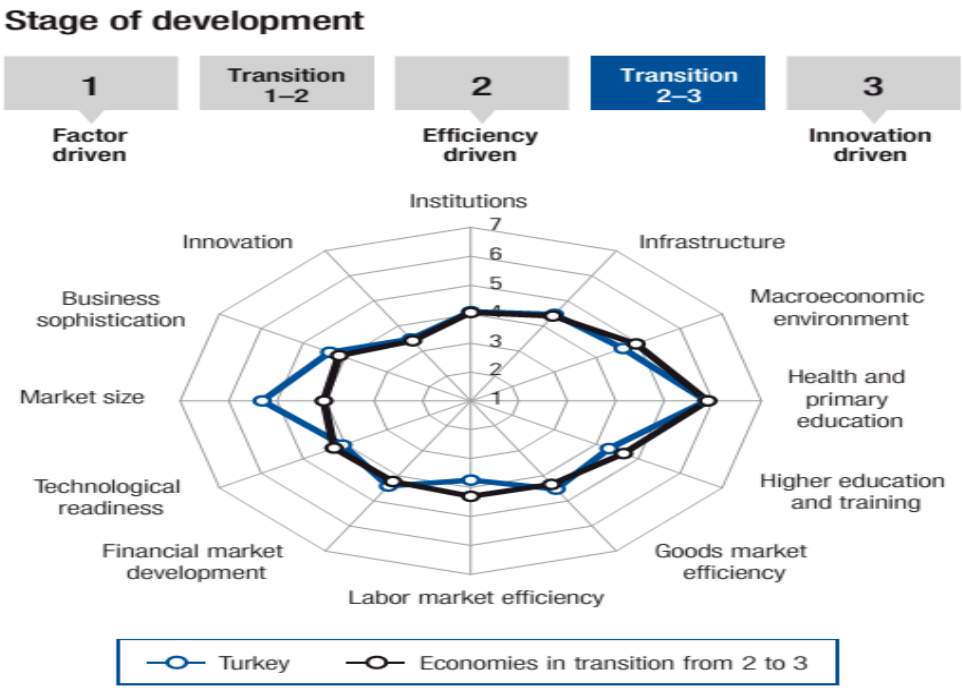
The Picture Identifying the Level of Development: Factor Intensity, Factor Efficiency, Innovation

According to a study conducted by the World Economic Forum, three different patterns could be seen in the economic development of countries: First, the economies where production factors are determinative. Second, the economies where factors' efficiencies have primary roles. Finally, the economies where innovation has a dominant role. Between these three main categories there are also transitory countries. The number of economies in the first group is 38 and those countries are heavily less developed or at the initial level of development phase.

The number of economies between the first and the second group is 17. A country in this group is described as transiting from an economy of availability of production factors to an economy of using production factors. The number of countries in the second category, where efficiency is determinative, is 33. These countries are situated at upper middle part of the developing countries.

Transitory economies between efficiency-based and innovation-based economies are at the frontier of factor productivity on the one hand, and have started to try innovation economy and have gained ground to some degree on the other hand. The number of economies between efficiency-based and innovation-based ones is 21. Turkey is located in this transitory group. The number of economies in the third main group, namely innovation-based economies, is 35. All developed countries are classified in this group.

When comparing Turkey's performance with the economies which based on factor-productivity and the economies which based on innovation, Turkey is relatively advantageous in terms of market size. Ho-



Source: WEF, 2014.

Figure 1. Stage of Development For Turkey

wever, efficiency of labour market, efficiency of goods market and quality of higher education and vocational training are relatively disadvantageous fields of the Turkish economy. In addition, institutions, innovation, development of financial markets, health and primary education appear to be in a similar situation. The figure below depicts this phenomenon.

Property Rights, Innovation and R & D

Since competitiveness level of economies determined mainly by the private sector, the safety of private property has critical importance. Promotion and protection of property rights will develop a desire to acquire property and this last point will lead to competition and processes that encourage innovation. Indeed, a private sector without a desire to own property would lose its dynamism.

Achieving superiority in terms of economic competitiveness is directly proportional to the potential of human resources and innovation. Therefore, development of economic competitiveness depends on development of human resources. An economy armed with qualified human resources is obviously having higher potential of innovation. In this respect, capacity of R&D personnel, R&D expenditures, and innovation level have separate significances to be examined.

Property Rights

Property rights are classified under three categories: Legal, physical and intellectual. According to the 2012 property rights data, Turkey is in the same group with China, Brazil, Mexico and Thailand. The highest value of the property rights index is 8.6 points out of 10 and belongs to Finland. The US and Canada with scores of 8.0 and 7.5 respectively come after Finland.

Countries with the highest property indices are listed as the North America, the Western Europe, the Central / Eastern Europe and the Central Asia, Asia and Oceania, the Middle East and the North Africa, the Latin America and the Caribbean, and Africa. Turkey does not look brilliant with the score of 5.3 points out of 10.

As noted above, property rights consist of legal, physical and intellectual rights and can be handled with these three components. "The legal and political environment" refers to the independence of the judiciary, rule of law, control of corruption and political stability. The score of Turkey for legal and political environment is 4.5 out of 10, and Turkey's rank is 73 in 130 countries. According to this criterion, the ranking and the score is compatible.

The score is 4.7 for independence of the judiciary, 5.2 for the rule of law and 5.0 for the control of corruption. The lowest score under this title is 3.0 points and is assigned for political stability. Turkey's political stability rank is 108 in 130 countries and seems quite poor when comparing to the economies in the same group. However, the governing party AKP has been in rule since the late 2002 and has been strengthening its voter support both in 3 national parliamentary and 2 nationwide municipal elections. With this strong trend, one would expect higher political stability rank and points for Turkey.

"Physical property rights" include the physical protection of property rights, registration of property and access to credit. Turkey's Physical Property Rights score is 6.2 out of 10 and its rank is 55 in 130 countries.

"Intellectual property rights" consist of protection of intellectual property rights, patent protection and copyright piracy. The score of Turkey for intellectual property rights is 5.2 out of 10 (Table 2).

Table 2. International Property Rights Index (2012, WIPO)

Category	Score	Turkey's rank (in 130 countries)
General Score	**5.3**	**65**
Legal and political environment	**4.5**	**73**
Judiciary independence	4.7	80
Rule of law	5.2	55
Control of corruption	5.0	57
Political stability	3.0	108
Physical property rights	**6.2**	**55**
Protection of physical property rights	6.0	69
Registration of property	8.8	38
Access to credits	3.9	64
Intellectual property rights	**5.2**	**59**
Protection of intellectual property rights	3.9	99
Patent protection	0.0	-
Copyright piracy	3.8	54

Table 3. Developments in Patent Applications in the World (Thousand), WIPO

	Total patent applications	Residents	Non-Residents
1985	921.7	651.1	270.6
1990	997.5	687.7	309.8
1995	1047.8	694.4	353.3
2000	1377.5	874.8	502.6
2005	1701.3	1039.3	662.1
2006	1792.8	1074.3	718.6
2007	1865.4	1119.7	745.8
2008	1915.1	1152.0	763.1
2009	1846.0	1139.7	706.3
2010	1979.1	1228.7	750.4
2011	2145.4	1358.6	786.8

In terms of patent applications Turkey's share is below the world average. The number of annual patent applications is over two million and the share of Turkey is only about 0.19% (Table 4). In order to prevent duplications, patent applications are grouped as patent families in terms of the country of origin. As of

2011, while the gross number of applications is about 2,145.4 thousand, with the patent family classification the number decreased to 996.8 thousand. It means that the net applications are less than half of the gross applications (Table 3).

In general, the most developed countries have higher shares in patents granted. Japan, the USA, Germany, South Korea, France, New Zealand are the leading countries in this field. However, some developing countries also have spectacular performance and listed among the first twenty patent champions such as North Korea and Russia.

Comparison of the number of patents of countries with their populations would give a more useful tool to compare economies. Accordingly, the number of patent applications per million people in 2009 is 2,612 in South Korea, 2,315 in Japan, 733 in the United States, 584 in Germany, 360 in New Zealand, 338 in Finland, 328 in North Korea, 275 in Denmark, 270 in Austria, 259 in England, and 35 in Turkey. The performance of Turkey is similar to the performances of Armenia, Moldova, Slovakia and Bulgaria (Table 5).

Table 4. Developments in the Share of Patents (Family) by the Country of Origin (2011)

Country	Share (%)	Country	Share (%)
China	24.54	China, Hong Kong SAR	0.63
United States of America	23.47	Singapore	0.46
Japan	15.97	Italy	0.45
Republic of Korea	8.34	South Africa	0.34
European Patent Office	6.66	Israel	0.32
Germany	2.77	Malaysia	0.30
India	1.97	New Zealand	0.29
Russian Federation	1.93	Indonesia	0.27
Canada	1.64	Ukraine	0.24
Brazil	1.32	Poland	0.19
Australia	1.19	Turkey	0.19
United Kingdom	1.04	Thailand	0.18
France	0.78	Spain	0.17
Mexico	0.66	Other	3.69

Table 5. Patent Applications Per Million People (2009)

Country	Number	Country	Number
Republic of Korea	2611.77	China	172.07
Japan	2315.14	Canada	150.18
United States of America	732.60	Italy	146.43
Germany	584.34	Australia	113.61
New Zealand	360.30	Spain	78.33
Finland	338.27	Poland	75.99
D.P.R. of Korea	328.24	Malaysia	44.15
Denmark	274.85	**Turkey**	**35.56**
Austria	270.52	China, Hong Kong SAR	21.27
United Kingdom	258.65	Brazil	20.29
Sweden	235.09	Chile	20.23
France	218.46	South Africa	16.67
Switzerland	217.46	Mexico	7.34
Israel	185.29	India	6.29
Russian Federation	180.46	Egypt	6.15

The performances of countries vary between patent applications (ex ante) and patents granted (ex post). Accordingly, the percentage shares of granted patents are 24% for Japan, 23% for the US, 17% for China, 10% for S.Korea, 6% for European Patent Office, 3% for Russia, 2% for Canada, 1.8% for Australia and 1.2% for Germany. As mentioned above, the number of patents granted is about 46 percent of total applications. In Turkey, the number of patents granted in 2011 is 893. The share of Turkey in the world total is very low (0.09%) and only 22% of applications result in getting a patent (Table 6).

Table 6. Patents Granted (2011, WIPO Database)

Country	Number	Country	Number
Japan	23.91	Netherlands	0.20
United States of America	22.52	Kazakhstan	0.19
China	17.27	Viet Nam	0.18
Republic of Korea	9.50	Norway	0.16
European Patent Office	6.23	Algeria	0.16
Russian Federation	3.01	Belarus	0.15
Canada	2.08	Austria	0.12
Australia	1.79	Philippines	0.11
Germany	1.18	Sweden	0.10
Mexico	1.15	Chile	0.10
France	1.02	Morocco	0.10
United Kingdom	0.72	Thailand	0.09
Italy	0.64	Turkey	0.09
Singapore	0.60	Finland	0.08
South Africa	0.53	Czech Republic	0.07
India	0.52	Colombia	0.06
Israel	0.51	Belgium	0.05
China, Hong Kong SAR	0.51	Egypt	0.05
New Zealand	0.47	Pakistan	0.05
Ukraine	0.41	Hungary	0.04
Brazil	0.35	Romania	0.04
Poland	0.31	Montenegro	0.04
Spain	0.28	Peru	0.04
Malaysia	0.24	Switzerland	0.04
		Other	1.50

Innovation and R & D Level of Performance

Depending on EU 2020 Innovation Union vision, Innovation Union ranking has been developed. The Ranking is based on 25 indicators. Inputs: Human resources- R & D systems, and company activities. Outputs: Innovations and economic outputs. The European Union's study aims to evaluate innovation performance, and assesses strengths and weaknesses of the research and innovation systems.

The EU's approach to knowledge, R&D and collaboration in university-industry can be formulated as follows: In principle, knowledge should be based on the project/research/R&D, and then the produced knowledge should be appropriate for implementation.

When we look at innovation performances of the EU members, Switzerland, Sweden, Denmark, Germany and Finland are located as the highest innovation category. Grouping the EU members as innovation leaders, innovation followers, moderates in innovation and weaks in innovation, we see that Turkey is classified at the last category as the candidate country.

1. *Innovation leaders of 27 EU members*: Denmark, Finland, Germany, Sweden (performances well above that of the EU27).
2. *Innovation followers:* Austria, Belgium, S.Cyprus, Estonia, France, Ireland, Luxembourg, Netherlands, Slovenia and the UK (performance close to that of the EU27).
3. *Moderate innovators:* Czech Republic, Greece, Hungary, Italy, Malta, Poland, Portugal, Slovakia and Spain (performance below that of the EU27).
4. *Modest innovators:* Bulgaria, Latvia, Lithuania and Romania (performance well below that of the EU27).

In general innovation parameters are gathered under the following headings: human resources, research systems, finance and support, firm activities, forward / backward linkages and entrepreneurship, and intellectual assets.

The outcome of those enabling factors is innovation doers and their economic impacts. According to the EU's yearly publication on innovation scorecard, Turkey is ranked with Bulgaria and Latvia and the innovation performance of this group is well below that of the EU27.

R & D Expenditures and R & D Performance in Turkey

According to UNESCO, in the world's 2007 R&D expenditures, the shares of countries are ranked as 33% for the USA, 23% for the EU, 13% for Japan, 9% for China, 6.3% for Germany, 3.7% for France, 3.4% for the UK, 2.2% for India, 2.0% for Russia and 1.8% for Brazil.

The countries which allocate the highest proportion of the national income to R&D are listed as Israel (4.5%), Japan (3.4%), the US (2.7%), Germany (2.5%), France (1.8%), the UK (1.8%), the EU (1.8%), China (1.4%), Russia (1.1%), Brazil (1.1%) and India (0.8%). The world average of R&D expenditure in the world output is 1.7%.

It can be said that the allocations to the R&D expenditures in Turkey is well below that of the world average (just half of it). This ratio was 0.5% in 2002 and 0.92% in 2012.

Table 7. R & D Expenditures in Turkey

Year	Ratio of R&D Expenditures to GDP (%)
1998	0.37
1999	0.47
2000	0.48
2005	0.59
2010	0.84
2011	0.86
2012	0.92

Source: Turkstat

The developments in the shares of the commercial sector, the public sector and higher education institutions in R & D expenditures provide clues about the nature and scope of R&D. The share of commercial institutions in R&D spending began to increase relatively faster since 2005. Until 2004, the share of commercial sector in R&D varied about 20-25%. However, it has increased steadily and reached 43.2% as end of 2011.

The share of R & D expenditures of the higher education institutions in national output has decreased in parallel with the increase in the share of the commercial sector. The share of higher education institutions was 68% in 2004. This ratio was about 45% in 2011. The other main sector in allocating financial resources into R&D activities is the public sector. The share of public sector in national R&D has remained stable over time and varies between 9-11%. The increasing share of the business sector in national R&D indicates the dynamism of the private sector.

The numerical increase in R & D human resources is striking in the 1990-2011 period. During this period the total number of people working in R & D increased by 4.5 times in general, 3.4 times in higher education, 2.9 times in the public sector, and 17.1 times in the commercial sector. Incentives and tax immunities for private sector have been the motivation behind this increase.

The manufacturing industry ranks the first in terms of the level of technological innovation in the period of 2002-2010. The service sector takes up the second place at technological innovation. However, the rate of technical innovation declined in mining in this period. The companies with more than 10 employees have the highest technological innovation level. The higher the scale of companies the more intensity the level of technological renovation.

Official data of Turkstat show that as of 2009 the biggest group of PhD holders belongs to social sciences and humanities. Accordingly, the share of doctoral degrees are listed as 34% in social sciences, 27% in medicine and health sciences, 19% in natural sciences, 15% in engineering and technology, and finally 5% in agricultural sciences. About 91 percent of PhD holders took their degrees from Turkey. The most preferred foreign countries for graduate education are the EU members and the North America.

The main financial resource for PhD education comes from higher education institutions as expected with a share of 62%. The share of self-financing is about 16%. The other employers other than education institutions have 12.5% in total financing. The duration of staying of PhD holders in a foreign country over 3 months is 14% in the period of 2000-2009. It is clear that this time length is very short. Considering the 9% of doctoral degrees from foreign countries, we can say that the remaining 5% is remarkably low.

Work and study experience in a foreign country is critically important for seeing international developments in higher education and training, doing joint studies and researches, and gaining transferable skills. Nevertheless, Turkish case doesn't provide a promising picture.

Sectoral Competitiveness and Performance Level in the Turkish Economy

In this section, concentration data of Turkstat, balance sheets of companies which have been collected by the Central Bank and the data provided in the publication named "Analysis of Manufacturing Industry in Turkey" published by the Turkish Development Bank are evaluated.

Concentration Level

In the Turkish economy, the highest concentration or monopolization is observed in those sectors which with the lowest value-added and efficiency. On the other hand, sectors with the highest levels of efficiency and value-added have the highest level of competitiveness.

Concentration ratios are calculated based on "Industry and Service Statistics" of 2008. The companies in this context are classified in their sub activities then by using the size of sales for each activity, concentration ratio is calculated according to NACE Rev.1.1 four digit classifications.

According to 2008 statistics, the composition of all companies in terms of activity class is as follows: 40.5% in wholesale and retail trade, 17.6% in transportation and warehousing, and 12.9% in manufacturing industry. The ratio of total sales of manufacturing industry to the total sales of all sectors is 28.6%. The share of sales of wholesale and retail trade is 44.4%.

Every class of different economic activities is taken as unit of activity type. In this review, a concentration ratio (CR4) is calculated by dividing total sales of the biggest four companies to the total sales of the class. Turkstat publishes concentration ratios in two-year periods. Ratios depend on data collected through a survey called "Annual Business Statistics- Industry and Service Question Form".

According to the data of 2010 very high concentration is observed in 127 classes. Companies covered by the "annual industry and service statistics survey" operate in 515 different classes. The levels of concentration are described as; CR4<30: low degree of concentration, 30 ≤ CR4 <50: a moderate concentration, 50 ≤ CR4 <70: a high degree of concentration, CR4≥ 70 CR4: a very high degree of concentration.

According to CR4, concentration is very high in 127 classes, high in 73 classes, moderate in 86 classes, and low in 229 classes. According to this calculation concentration degree is very high in 28.6% of activity classes in the manufacturing industry.

While concentration degree is low in 72.5% of the classes in the wholesale and retail trade sector and in 72.7% of the classes in the construction sector, it is very high in 57.1% of the classes in mining and quarrying, 41.7% of the classes in ICT.

Looking at concentration degree at manufacturing industry, while 29% of sub classes have very high concentration, 17% has high concentration and thus high concentration level seems 46% of the Turkish manufacturing industry.

Table 8. The Concentration Levels of Economic Activity Classes, 2010 (Correlation of Number of Firms and Concentration Degree, %)

Sector	Correlation Coefficient (CR4 * Number of Firms)
B - Mining and quarrying	89
C - Manufacturing	38
D - Electricity, gas, steam and air conditioning supply	68
E - Water supply, sewerage, waste management and remediation activities	23
F – Construction	35
G - Wholesale and retail trade, repair of motor vehicles and motorcycles	28
H - Transportation and storage	55
I - Accommodation and food service activities	36
J - Information and communication	13
L - Real estate activities	100
M - Professional, scientific and technical activities	49
N - Administrative and support service activities	51
P - Education	54
Q - Human health and social work activities	50
R - Culture, arts, entertainment, recreation and sport	54
S - Other service activities	31

In terms of revenues of sectors, trade, manufacturing, transport and communication and construction handles the most turnovers. The largest turnover belongs to "Wholesale and retail trade; motor vehicles, motorcycles and repairment of personal and household goods" with a share of 45-50%. The second biggest sector with turnover volume is the manufacturing sector with a share of 25-30%.

Scale of Company by Number of Employees and Turnover

According to the data reported to the Central Bank, reporting firms are predominantly small-scale companies. Thus, although consolidations have taken place in time, the Turkish economy has still been dominated by small-sized companies. The ratio of small-scale companies is 43%. However in terms of number of employee and net sales, those ratios are 4% and 13% respectively. The ratio of large-scale companies is 9% in number, 61% in number of employees, and 55% in sales (Table 9).

A noteworthy issue for companies is the high level of credits denominated in foreign currency. Although reverse money substitution and strengthening of Turkish Lira after IMF-supported stabilization program which started to implement in 2001 crisis, 68.2% of credits taken by companies are still denominated in foreign currency. To explain this phenomenon, three alternative explanations can be presented: Firstly, companies have to use intensively overseas funds due to insufficient domestic savings. Secondly, banks also lent to companies of foreign credits. The argument of inadequate domestic savings makes borrowing from abroad more reasonable. The third explanation can be developed depending on potential instability in the Turkish economy, i.e. due to decreasing interest rates and increasing current account deficits, lenders may prefer to lend in foreign currency.

The ratio of foreign funds to total balance sheets is 67% in 2000, 64% in 2002 and 49% in 2005. Companies are quite cautious when using foreign resources,

Table 9. Sector Balance Sheets (CBRT, 2011)

	All companies			Manufacturing		
In terms of employment	**Number of firms**	**Employees %**	**Net sales %**	**Number of firms**	**Employees %**	**Net sales %**
Small (number of employees<50)	3870 (43.4%)	3.9	13.0	996 (29.1%)	2.7	5.2
Medium (50<= number of employees <=500)	4257 (47.7%)	35.5	32.2	2018 (59.0%)	37.8	30.3
Large (number of employees >500)	798 (8.9%)	60.6	54.8	407 (11.9%)	59.5	64.5
TOPLAM	**8925**	**100.0**	**100.0**	**3421**	**100.0**	**100.0**

and they also may not find foreign credits easily. For last few years, a moderate increase in the leverage continues to rise.

The ratio of short-term resources used by firms was 71% in 2000, 63% in 2002, 74% in 2005 and 66% in 2011. Even if there has been is a decreasing trend in the share of short-term liabilities of companies, the level is still very high. Two third of foreign resources of Turkish companies may indicates a high risk of fragility.

Table 10. Pattern of Companies on Using Banks Credits and Other External Resources (CBRT)

All companies	2000	2002	2005	2009	2010	2011
7-Short-term claims / current assets ratio (%)	40.6	44.5	42.2	48.1	46.0	43.3
1-Total liabilities / total assets ratio (leverage ratio) (%)	66.5	63.9	49.0	55.4	55.9	57.2
3-Shareholders' equity / Total liabilities ratio (%)	50.4	56.5	104.1	80.5	78.9	74.8
12-Short-term liabilities / Total liabilities ratio (%)	71.4	62.8	73.8	70.5	69.2	66.2
15-Bank loans / Total liabilities ratio (%)	38.1	41.2	31.9	34.9	37.4	41.7

Source: CBRT, Sectoral Balance Sheets.

The last few years have witnessed an increase in the use of foreign resources. In fact, according to the Central Bank database, net liability of foreign currency of the Turkish companies (excluding banks) was $19 billion in 2004, and increased steadily over time and reached $162 billion in 2013. The ratio of foreign currency is quite different in deposits, loans and securities.

Money substitution has been a long-standing phenomenon in Turkey almost for a quarter century between the early 1980s and early 2000s. However with implementing IMF-supported stability program, AKP government has managed to reverse this trend towards Turkish Lira. Reverse money substitution is a remarkable development in the Turkish economy. The ratios of foreign currency in deposits, credits and debt securities have decreased incredibly since 2004. In 2002, while the share of foreign currency was 59% in total deposits, 58% in credits and 39% in debt securities; in 2013 these ratios were 35% in deposits, 27% in credits and 17% in government debt securities. Almost all securities are bought directly by banks and then resold to the other buyers. Therefore, support of banks (creditors) is stronger than that of borrowers (depositors).

The high level of net liability of foreign currency of banking system started and deepened the 2001 crisis. This deficit also delayed the exit from that crisis. Net liabilities of banking system to foreign banks were $5.5 billion in 2003 and $79 billion in 2013. Therefore it can easily be said that the foreign currency borrowing trend of the Turkish private sector is a product of a systemic mechanism.

Performance Comparison in Manufacturing Sub-Industries

The Turkish manufacturing industry is based heavily on traditional technologies. The Ministry of Development estimates that the share of exports of high-tech sectors in the manufacturing industry was 3.7% in 2012 and estimates it to be 5.5% in 2018. In terms of middle-tech or middle-income trap, the appearance of Turkey doesn't seem very brilliant.

In one analysis of the Turkish Development Bank on the Turkish manufacturing industry, 22 manufacturing sub-industries are ranked in terms of production, capacity utilization, export, revealed comparative advantage, employment, productivity and price performance. Accordingly, when examining the sectors with high performance, the most striking finding is that the Turkish manufacturing industry comes face to face with medium-tech trap. When comparing the Turkish manufacturing industry with innovation economies, due to high price elasticity of demand for Turkish exports, low level of innovation-based exports, and relatively high performance of the traditional sectors, it is hard to obtain a positive picture.

Evaluating production, the capacity utilization rate, competitiveness, employment, and productivity of manufacturing sub-industries give prominent sub-industries, which were listed as tobacco, textiles and leather processing, wood and cork products, paper and paper products, and electrical machinery and devices. The trend of switching production of ICT to developing countries and relatively advantageous sectors give an opportunity to explore the sectors that need to be improved.

The Turkish manufacturing industry and its sub-industries are analyzed for a certain period of time and the following findings are obtained:[1] While the number of paid workers increased 34% between 2003 and 2008, the value of production increased 57% in the same period (in 2008 fixed prices) and the increase in value-added was 23%. On the other hand, the rate of value-added was 25.1% in 2003 and 19.7% in 2008.

1 Turkish Development Bank, *Analysis of the Turkish Manufacturing Industry*, (in Turkish), 2012.

Production value per worker increased 18% between 2003 and 2008, while per capita value-added decreased 8%. The decrease in value-added rate indicates that the manufacturing industry realized lower value-added production.

Production index has increased 14% and this increase mainly resulted from the increase in per capita productivity; because while the employment index was about unchanged in the same period, the index of production per employee increased by 15%.

Values of exports and imports in current USD increased 54% and 57% respectively for the period 2005-2010. The ratio of exports to imports declined by 2 points in manufacturing industry. Foreign trade deficit for manufacturing industry was $28.5 billion in 2003, and increased to $46.7 billion in 2008.

According to the evaluation of the sectoral performances for the period 2005-2010, the highest performing sector was electrical machinery and equipment industry. This sector composes sub-industries of electric motors, generators, electrical distribution and control equipment, electric bulbs and lighting devices, and wires and cables. The next most performing sector was wood and wood products sector.

The lowest-performing two sectors in the period 2005-2010 were the radio, TV, devices sector, and office, accounting and computing machinery sector. Surprisingly, these two sectors had the highest level of technology among 22 sectors.

When evaluating performances of sectors, different sectors stood out on the basis of each criterion. The highest rank in performance belongs to wood and cork products in manufacturing index increase, tobacco in capacity utilization increase, paper and paper products in export growth, confectionary in foreign trade competitiveness, electrical machinery and apparatus in employment growth, tree and cork products in productivity growth, and petroleum products in price increase.

In the same period, the lowest performances on the basis of each criterion went to radio, TV etc. equipment in production index increase, furniture etc. products in capacity utilization increase, radio, TV etc. devices in export growth, office, accounting and computing machinery in foreign trade competitiveness, confection in employment growth, radio, TV etc. devices in productivity growth, and Other transportation vehicles in the price increase.

In terms of clustering approach, regional distribution (NUTS 2) of sub-industries of manufacturing shows that the highest number of mature cluster belongs to TR42 sub-region (Kocaeli, Sakarya, Düzce, Bolu and Yalova). Izmir (TR31) was the second with more mature clusters.

The most developed regions of Turkey have many mature clusters. In addition, these regions have also higher specialization over Turkey's average and are predominant in many sectors relative to the rest.

Relatively less developed regions do not have any industries that reach substantial size in national scale. The dominant sectors in these regions only come to the fore in the related region.

Food and drink industry is the most matured cluster across the country. This sector seems as a mature cluster in 7 regions. Textile industry is the second most mature sector in 5 regions after food and drink industry. The mature clusters in relatively less developed regions are food and drink, plastics and rubber products, mineral products and metal products (Table 11).

Competitiveness at Regional Level

Based on the data of statistical area classification by the Turkish Statistical Institute, a study[2] calculated the level of competitiveness levels. Calculation of competitiveness levels and ranks are based on economic efficiency and viability; labour market; innovation capacity on the basis of technical staff, R & D and patents; education; physical infrastructure, and social capital.

Accordingly, in terms of competitiveness the Marmara region comes first. This region is followed by the Western Anatolia and the Mediterranean. The regions with the lowest levels of competitiveness are listed as the East Anatolia and the Southeast Anatolia. Ranking of regions in terms of sub-components of competitiveness do not differ significantly.

2 Alpay Filiztekin, "Competition Index of Turkey", in, *A Competition Index for Turkey*, Deloitte & Ekonomi ve Dış Politika Araştırmalar Merkezi, İstanbul, 2009.

Table 11. Performance of Sectors (Overall and Criterion-Based) for the Period 2006-2010

NACE code	Sector / Industry	Production index	Capacity utilization ratio	Exports	Revealed Comparative Advantage	Employment	Productivity	Producers' price index	Overall
15	Food and drink	13	5	14	5	3	21	4	5
16	Tobacco	14	1	4	3	19	3	18	3
17	Textile	19	12	19	4	18	11	2	15
18	Confection and fur processing	20	17	21	1	22	16	14	20
19	Leather products	12	5	17	16	7	9	7	13
20	Wood and cork products	1	4	7	10	11	1	19	2
21	Paper and paper products	10	19	1	19	14	7	7	16
22	Printing and publishing	14	15	20	18	12	14	4	19
23	Petroleum products	21	20	3	17	12	20	1	18
24	Chemicals and chemical products	5	2	6	20	17	4	12	14
25	Rubber and plastic products	16	16	9	8	2	19	7	6
26	Mineral products	16	18	16	2	16	13	10	10
27	Base metal	7	10	11	13	9	18	3	8
28	Metal products	10	12	10	6	4	17	6	4
29	Machinery and equipment	9	11	12	14	5	11	12	12
30	Office, accounting and computing machinery	18	21	4	22	21	10	20	21
31	Electrical machinery and equipment	2	2	2	12	1	4	10	1
32	Radio, TV etc. equipment	22	12	22	15	19	22	21	22
33	Medical, precision and optical instruments, and watches	3	8	8	21	6	6	15	11
34	Motor vehicles, trailers etc.	7	8	15	9	8	14	16	7
35	Other transport vehicles	6	5	18	11	10	8	22	17
36	Furniture and other products	4	22	13	7	15	2	16	8

Note: The values in the table show ranks of the sectors. The lower the rank, the higher the comparative advantage of that sector.
RCA: Revealed Comparative Advantage.

According to the findings of a study[3] the East and Southeast Anatolia regions are the neediest regions in terms of social assistance. On the other hand, the least needy regions are Marmara and West Anatolia as expected.

In fact, socio-economic development index (SEDI) publicized by the Ministry of Development in 2003 and 2011 reached the parallel conclusions for the level of social assistance and competitiveness of regions. The parameters which the Ministry of Development took into consideration in the calculations are demography, education, health, employment, competitive and innovative capacity, financial capacity, accessibility of services, and quality of life.

Conclusion

Turkey is in the league of developing countries in terms of political, civil and economic freedoms. In spite of being candidate to the EU membership for over half a century, it couldn't break its shell yet in these fields of civilization. In fact, the performance of Turkey is not satisfactory in the areas of level of human development, ease of doing business, education, competitiveness and economic growth. Besides, perception of corruption doesn't give a brighter appearance.

Today, countries are classified with regard to their factor endowment, factor efficiency and innovation levels. Accordingly, while the prospects of innovation-based economies are more advantageous, relatively more disadvantageous economies are based on factor endowment

Turkey is situated between the groups of factor-efficiency and innovation-based economies. Turkey is very close to the margins of the factor-efficiency. However, to switch to the next stage totally depends on innovation capacity that Turkey has been very late to construct it effectively.

Turkey has comparative advantage in one field and comparative disadvantages in three fields relative to the countries in the same level of development. The main relatively advantageous field of Turkey is its bigger market size. Disadvantages of Turkey are inefficient labour market, low quality of higher education and vocational training, and poor work ethics. Comparing with the EU members, the only advantage of

3 Metin Toprak, "Settlement Area Approach to the Struggle against Poverty: Two Step Formula for Poverty", *İktisat, İşletme ve Finans*, 29(300), March 2011, pp.9-44. (in Turkish).

Turkey is its relatively bigger market size. However, having only one comparatively advantageous feature is very challenging for a candidate country.

Property rights index of Turkey is not very satisfactory. Besides, in terms of patent applications and granted patents, its performance is quite low. Turkey's economy seems being caught in the trap of medium technology. Taking its present mindset and projects into consideration, it can be foreseeable that Turkey would remain at the same level of development for a while. Production, foreign trade, borrowing and innovation patterns of firms reinforce this feature. Turkish companies are in a serious handicap in accessing to finance. Foreign financial resources can play an important leverage role. Foreign finance has been used directly by companies and indirectly via banks.

Institutionalization of macroeconomic stability, encouragement of foreign investments and portfolio investments emerge as the priority policy areas in Turkey. Today, two-thirds of foreign direct investment in the world belongs to the advanced economies. Besides, more than 90 per cent of international savings goes to the developed countries. Hence, the natural resource-rich countries as well as countries like China and India which are the champions of finished goods direct their savings to the developed financial markets. International savings meet the financial needs of the developed markets, and this trend seems to continue.

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