

**Protection of
Intellectual
Property Rights
in Turkey:**

**Impact
on Foreign
Direct
Investment**



International Investors Association

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Protection of Intellectual Property Rights in Turkey: Impact on Foreign Direct Investment

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About Istanbul Economics

Istanbul Economics, founded and managed jointly by Sinan Ülgen and Can Buharalı, is a consultancy office providing strategic management consultancy services to diverse sectors and companies, and conducting research on economics related issues with a focus on market entry strategies, regulation and competition issues.

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Abbreviations

EU
European Union

R&D
Research and Development

CIS
Commonwealth of Independent States

BEA
U.S. Bureau of Economic Analysis

IPR
Intellectual and Industrial Property Rights

ICI
Istanbul Chamber of Industry

OECD
Organization for Economic
Co-operation and Development

PRA
Property Rights Alliance

TFP
Total Factor Productivity

TRIPS
Agreement on Trade Related Aspects of Intellectual
Property Rights

TUIK
Turkish Statistical Institute

UNCTAD
United Nations Conference on Trade and Development

WEF
World Economic Forum

Preface



YASED International Investors Association is the leading representative of international companies operating in Turkey since 1980. Our association strives for a better business and investment environment in Turkey, in order to facilitate Turkey to step up to the status it deserves among developed countries under global competition conditions. To this end, YASED is keeping up its activities aimed at attracting high value-added greenfield investment that will generate employment in Turkey, increasing the satisfaction of existing investors, and configuring Turkey as a major investment location of the world.

Today, in a global environment, where liquidity is so restricted and under domestic conditions, where the current deficit is expected to exceed USD 50 billion as of end 2008, the sustainability of foreign direct investment (FDI) inflows as a long-termed and secure way of financing this deficit is yet more significant.

As pointed out in the 2008 World Investment Report of the UN Conference on Trade and Development (UNCTAD), which was publicized in Turkey by YASED concurrently with the rest of the world, although global FDI inflows have reached a record high level with USD 1.8 trillion, it is forecasted that the current global crisis will likely cause a 10% decline in FDI in 2008. It is obvious that this decline will continue in 2009 as well. In such an investment environment, Turkey should give greater priority to putting into effect the policies and legislative measures necessary for securing that it does not lose its comparative advantages and strengthening these yet further.

We at YASED are keeping up our efforts through our Intellectual and Industrial Property Rights Working Group for the protection of intellectual and industrial property rights - as one of our priority issues - oriented at the improvement of the existing laws and practices on par with international standards and the establishment of a healthier investment environment for international investors.

In this framework, we hope that our report titled, "Protection of Intellectual Property Rights in Turkey: Impact on Foreign Direct Investment" prepared by Istanbul Economics, with valuable participation from our Working Group, will contribute significantly to the existing studies.

The report puts forth the multidimensional relationship on the world between the protection of intellectual property rights and foreign direct investment, the economic effects of intellectual property rights violations and investment opportunity losses, additional burden generated on public finance; and the potential gains in cases the measures necessary for the protection of intellectual and industrial property rights are taken, with comparative examples and gives concrete suggestions in this connection. We present our report to your kind attention and take his opportunity to express our sincere thanks to all those, who have contributed significantly to this work - primarily the members of the Working Group, YASED members, YASED Secretariat - and Istanbul Economics that gave life to this work.

November 2008

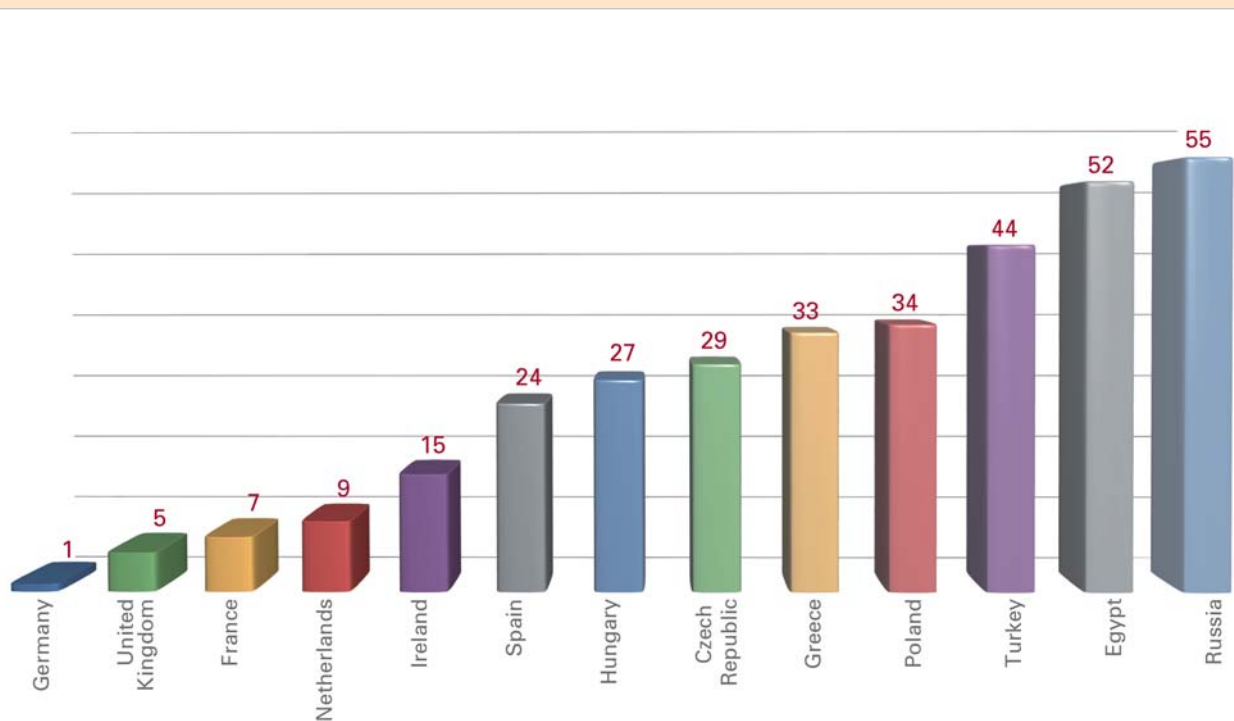
Executive Summary

The significance laid on the protection of intellectual property rights in the international economy has had an impact on the economic policies of Turkey, a country which has made considerable progress in integrating with the global economy. Improvements have been made in the legislation governing intellectual property rights, particularly after the Customs Union Agreement, which came into force in 1996. Yet, although the European Commission expresses in the 2007 Progress Report, which evaluates Turkey's harmonisation with the the European Union (EU) legislation, that Turkey's legislation is to a large extent in conformity with the EU Acquis on this area, the Progress Report also highlights a major shortcoming, by asserting that Turkey is among the most problematic countries on the world, regarding the protection of intellectual property rights. The effects of the legal reforms made have in fact not reached the desired level. The problems concerning counterfeit, contraband and copied products are still underway.

It is acknowledged however that implementation is not less important than the legislation for reaping the benefits anticipated from the intellectual property rights regime. The deficiencies faced during implementation affect the economic process in many dimensions. There is a direct and close correlation between the effectiveness of IPR protection and the growth, technological transformation, efficiency, and investment trend of the economy, and especially its potential to attract FDI.

The correlation between IPR protection and foreign direct investment is multidimensional, too. The weakness of the IPR regime as a general rule, impede FDI inflows and damage the attractiveness of the country concerned, because of the relatively high risk of theft and unauthorized copying of the technology to be transferred. Field studies made on the relationship between IPR and FDI also illustrate these conclusions. It should be recalled here that Turkey ranks 44th among 70 countries in the 2007 IPR protection index rating of the Property Rights Alliance (PRA); and it should be underlined that the positions on the same list of the regional countries - with which Turkey competes for FDI inflows - are as follows; Hungary 27th, Czech Republic 29th, Greece 33rd and Poland 34th.

Chart 1: PRA international property rights index ranking



Source: PRA 2007

The significance given to IPR protection is not the same for all sectors. The importance attached by companies for IPR protection is directly correlated with the significance of the intangible assets of these companies, which are under IPR protection. Companies or sectors, in which the values of such intangible assets are high, give more importance to IPR protection in the countries they plan to invest. For instance, cross-border investment decisions in sectors such as; metal industry, food, distribution services and tourism, develop according to the market potential and input costs of the target country. In these sectors, the influence of the effectiveness of the IPR regime on cross-border investment decisions is limited. On the other hand, IPR do not play a major role in companies and sectors, where unauthorized copying of the production technology is costly. The effectiveness shown by the target country for IPR protection however, is very important for companies which control technologies and products such as chemicals, pharmaceuticals, and software, which can be copied relatively easily.

The condition of the IPR regime is also influential of the characteristics of the investments to be made. Wherever protection is weak, FDI inflows remain limited with sales- and distribution-based operations, and this situation fuels the import dependency of the industry. Studies demonstrate that a one point increase in the Intellectual Property Rights Index increases the likelihood of international investors to invest in production, instead of sales and distribution operations, by 57% - provided that these investors take the decision to invest in a country. It is therefore practically possible to shift FDI inflows from sales and marketing to production and even R&D operations through improvements in IPR protection. In fact it can be seen that strengthening of the IPR system speeds up the technology transfers of transnational corporations, which have already invested in a country. The technology content of production operations in the invested country consequently increases, and production and exports shift to higher-technology products.

There is a close correlation between IPR protection and countries' economic performances as well. Countries' IPR systems affect their growth, technological transformations, FDI performances, export and employment capacities and prosperity potentials.

A further step has been taken in the report and some

scenarios have been developed with the purpose to forecast the general economic effects the strengthening of the IPR regime would have on the attraction of further FDI inflows with diverse characteristics. According to the results of the model used in the research carried out jointly by Walter Park, who is one of the creators of the Ginarte-Park Index, and Douglas Lippoldt in 2008 (Park and Lippoldt 2008), a 10% increase in the Patent Rights Index of a country generates a 16% rise in the subject country's FDI stock. By taking into account that Turkey's FDI stock has reached USD 120 billion as of August 2008, such a development in IPR protection would accordingly indicate a potential FDI inflow volume of USD 19.2 billion. In other words, in case Turkey improves its IPR protection level to that of Hungary, it might attract additional FDI worth of USD 19.2 billion.

Improvement of the IPR system will increase the attractiveness of the manufacturing industry in the eyes of international investors much more than the agricultural or service sector would. From this perspective, in case the additional FDI inflow amount of USD 19.2 billion would go to the manufacturing industry;

- > 150,000 jobs, which correspond to 0.7% of current employment, would be generated in Turkey,
- > Current export volume would increase by 12%, which corresponds to approximately USD 13 billion,
- > National income would increase by 0.7% of GNP, which corresponds to USD 4.4 billion.

On the other hand losses are involved too, in case adequate care is not given to IPR protection. The inadequacy of IPR protection would first of all affect FDI inflows - directly and indirectly. The initial unfavorable effects would be on decisions of transnational corporations planning to invest in Turkey, which are benefiting from technologies and products that can be duplicated easily. But, the investment decisions of some other transnational corporations, which consider Turkey as a potential investment destination, might also be affected unfavorably from these circumstances. The reason is that the IPR protection performance of a country functions as a "signal" on the investment climate of the target country. The IPR protection level functions as a significant indicator for international investors confirming that

they will be treated justly and be protected from unfair competition in the subject country. It is obvious from this perspective, that the unfavorable economic effects of IPR violations will not be restricted to companies and sectors subject to such violations. IPR violations establish a norm about the overall investment environment prevailing in a country - for all sectors without making any distinction. The unfavorable economic effects of these violations, therefore extend beyond the losses inflicted directly, and include the lost potential contributions of FDI, which would have gone to the subject country but have abandoned this decision because of IPR violations.

The need for achieving effectiveness in fighting IPR violations acquires even more importance at a time when Turkey endeavors to accomplish its industrial transformation and reinforce its technological structure. Turkey is compelled to reinforce its technological structure in order to transform its production structure, and accomplish productivity increases, which in turn will sustain economic growth. This can be achieved by attracting FDI inflow to areas with higher technology content. FDI inflows to such areas can only be promoted by effective IPR protection.

The prospect for Turkey to capture the above mentioned potential benefits depends on its success

in demonstrating on the international platform that IPR violations shall not be tolerated. In addition to the eradication of problem areas related to implementation and enforcement, another indispensable requirement for reaching this target is to change the attitudes and perceptions prevailing in the society. IPR policy have from time to time been exploited as a social policy instrument. It was considered that inexpensive but unauthorized copying of foreign-origin technologies and products would generate positive effects on consumers. As in the case of the informal economy, the actual dimension of the harmful effects of IPR violations was missed. That is the reason why the legislative change made in the IPR system must be endorsed by a change in the general social attitude. It is necessary to increase awareness in the society on this issue.

Protection of IPR should not solely remain as a priority of state authorities but should be configured as a goal shared broadly by all sections of the social community. The establishment of this type of awareness again depends on the public policies to be implemented in this direction. In other words, solution of the problems faced in connection with IPR violations, will depend primarily on the implementation of the appropriate education and communication strategies, which will create and strengthen the necessary social awareness.

I. Introduction

Growth depends on the capacity of an economy to generate innovation and commercialize innovative products.

Intellectual property rights play an indispensable role in the formation, development and protection of innovative capacity.

Growth is a topic that never drops away from the world's economy agenda. Throughout history all states have searched for ways to catch faster economic growth rates, notwithstanding the prevailing economic conditions and their levels of economic development. This search is still going on in our day. Discussions on the resources and grounds for growth are continuing, and alternative economic policies to be implemented for this goal are occupying the agenda. Although there are some differences on the opinion regarding the details of these economic policies, there is a wide-ranging consensus on at least a few of these issues. An area, where a certain agreement has been reached on growth-oriented policies is innovation. It is already known that growth, particularly in developed countries, is closely related with the capacity of the economy to generate innovation and commercialize innovative products. Innovation in our day has become one of the basic factors that promote growth. Intellectual property rights on the other hand, play an indispensable role in the formation, development and protection of innovative capacity. The effectiveness of the intellectual property rights regime has a critical importance in the economy's attempt to reach its innovative potential. This is the reason behind the international collaboration aimed at the development of legal instruments for the protection of intellectual property rights.

Chart 2: International treaties on protection of intellectual property rights

Characteristic of the intellectual property	Protection instrument	Protected area	Place of use	International Treaties
Industrial property	Patent and utility model	New inventions suitable for industrial use	Manufacturing industry, agriculture	Paris Convention Patent Cooperation Treaty Budapeşte Treaty Strasbourg Agreement
	Industrial design	Industrial designs of products	Manufacturing industry, ready wear, automotive, electronics etc.	Hague Agreement Locarno Agreement
	Trademark	Distinctive marks and symbols	All sectors	TRIPS Madrid Agreement Nice Convention Vienna Convention
	Geographical indication	Descriptive place names	Wine and spirits	Lisbon Agreement
Artistic property	Copyright and neighboring rights	Authors' rights	Publishing, broadcasting, software, TV, video games	TRIPS Berne Convention Rome Convention Geneva Convention Brussels Convention WIPO Copyright Treaty WIPO Phonograms Treaty Universal Copyright Convention
Trade secret	Rules against unfair competition	Confidential business information	All sectors	TRIPS
Other	Integrated circuits	Original designs	Electronic circuit producers	TRIPS
	Databases	Databases	Informatics	Washington Treaty
	Plant production	New and different plant varieties	Agriculture	TRIPS, UPOV

Improvements have been made in the legislation governing intellectual property rights, particularly following the Customs Union Agreement.

Turkey continues to stand among the most problematic countries in the world.

These developments on the international arena have had an impact on the economic policies followed by Turkey, a country which has achieved significant progress in integrating to the world economy. Improvements have been made in the legislation governing intellectual property rights, particularly after the Customs Union Agreement, which came into force in 1996. Although the European Commission expresses in the 2007 Progress Report, which evaluates Turkey's harmonisation with the the EU, that Turkey's legislation is in conformity with the EU Acquis to a large extent on this area, also points out at a major deficiency by stating that Turkey is among the most problematic countries on the world, regarding the protection of intellectual property rights. The effects of the legal reforms made, have in fact not reached the level desired. The problems concerning counterfeit and contraband products are still prevailing.

It is known however that implementation is not less important than the legislation for the successful realization of the benefits expected from the intellectual property rights regime. The deficiencies related to implementation affect the economic process in many dimensions. There is a direct and close relationship between the effectiveness of intellectual property rights protection and the growth, technological transformation, efficiency, and investment trend of the economy, and particularly its potential to attract FDI.

The objective of this report is to shed light on these relationships and to highlight the benefits, which a more advanced intellectual property rights regime would generate for the country's economy - including the proper and effective implementation of laws - and its significance during transition to a more value-added economy. The "intellectual property rights regime" expression used in the report should be interpreted to mean both the legal process that begins with the registration of patent rights and continues until enforcement in cases of infringement. The beginning part of the report analyzes the theoretical framework of the relationship between FDI and intellectual property rights. The following section explains the general impact of intellectual property rights on the economy. The last part contains an analysis of Turkey's intellectual property rights performance, under the light of this information and the potential impact of an improvement in intellectual property rights on FDI inflows, national income, exports and employment is evaluated.

II. The Impact of Intellectual Property Rights Protection on Foreign Direct Investment

A - A theoretical background

Production processes, thanks to globalization, have gone through vast changes during the last decade. Vertically-integrated giant companies, which had originally gathered the units of their production chains with different characteristics together in a single company or even a single plant, are gradually configuring their organizational structures in line with the dynamics of the global economy and reorganizing for higher productivity levels. Following the modularization of the production process, the companies will have to decide on which stage of the value chain they will want to position themselves and accordingly choose the modules the responsibilities of which they will have to transfer to other parties. Success in global competition can be achieved only by companies, which give such decisions on time. The modularization of this value chain, which is based on outsourcing or sub-contracting operations, also facilitates the transfer of the production process to the international platform. Transnational corporations have the means to take care that, the most efficient companies operating in countries with highest advantages, undertake the production of such different modules. The significance of intellectual property rights comes to light at this point; since the intellectual property rights protection to be provided by the countries aspiring to welcome the production to be relocated, is taken into consideration in the selection of the country in which the subject production will be deployed. In other words, globalization has created new opportunities for developing countries by facilitating the relocation of production by dividing it into modules. The likelihood to make the most of this opportunity is related directly with the importance given to the protection of intellectual property rights.

It would be helpful to review the reasons behind a company's decision to invest abroad, in order to assess the effect of the intellectual property rights (IPR) regime¹ on FDI. It is accepted that transnational corporations enjoy some advantages, namely intangible assets. These assets, called 'property advantages' include elements such as new technologies, accumulation of a particular know-how, and organizational skills. Transnational corporations may decide to invest in other countries with the intention to make use of such advantages in new markets. Investing however is not the only gateway to a new market. Companies with the above-mentioned advantages may as well choose to enter overseas markets through exports. Hence, there are two additional requirements for a company to invest abroad. The first requirement is that the country to be invested in should be able to offer some advantages, which would make the relocation of production profitable. The advantages in this category, which are called 'location advantages' may involve justifications such as avoidance of freight costs, decrease in labor costs, procurement of lower cost inputs, a wide-ranging access to the distribution network, prospects of operation in a more advantageous regulatory framework. The second requirement involves the market access strategy of the transnational corporation. At this point, the subject transnational corporation should choose to keep the production operation within itself, rather than transferring it to a third part by means of a license agreement. Justifications such as; avoiding any disputes that might arise with potential licensees, control of quality during the production process and refraining from entrusting the know-how to others, are the key factors which might effect this decision.

The importance given to the protection of intellectual property rights influences transnational companies' investment decisions multidimensionally.

The importance given in a country to the protection of IPR influences transnational companies' investment decisions multidimensionally. First of all a company requires a property advantage to plan an investment in a foreign country. A property advantage is mostly protected by an intellectual, industrial or commercial property right. In other words, there is usually an intellectual property right which belongs to

the investing company, behind the move that initiates the cross-border investment process. The IPR regime affects also the second requirement of the FDI decision, i.e. the location preference. The qualifications of the regulatory framework in force in the country to be invested in, and consequently the importance given to the

protection of IPR, are influential in the investment decision. For instance, the weakness of the IPR regime increases the risk of theft and unauthorized copying of the production technology or the know-how to be transferred to that country, and impair the value of the "location" advantage to be offered to the international investor. The IPR regime is also influential in the determination of the market access strategy, which is the second component of the cross-border investment decision; since the prospective investor company will do its best to find the most feasible investment method in order to keep safeguarding the property advantages, such as intangible assets, in the subject market. In countries where IPR protection is inadequate, companies may withdraw from investing, due to concerns that their property advantages will not be protected. On the other hand, in

Reinforcement of intellectual property rights promotes technology intensive FDI inflows.

countries, where IPR are ideally protected, companies may choose to serve the subject market by entering into a license agreement with a local company, instead of making a direct investment, since the strength of the intellectual property system will avoid any potential damage to be inflicted on the property advantage of the licensee company, which actually belong to the mother company and are under protection by IPR.

Hence, the FDI performance of a country is closely related to its efficiency in protecting IPR. Furthermore, the sectoral characteristics affect the FDI-IPR relationship as well. Specifically, the importance given and the awareness shown by different sectors to the protection of IPR in FDI decisions vary according to sectoral characteristics. For instance, it is evident that transnational corporations refrain from transferring R&D or high-technology based processes under IPR protection, to countries lacking

strong protection regimes. On the other hand, one should not expect the companies, which invest only in a sales or distribution operation, to be equally sensitive about the characteristics of the IPR regime of the country they are investing in. Similarly, the characteristics of the IPR regime are not equally critical in the FDI decisions of companies and industries which use lower technologies and standard production methods. So, from the FDI capacity perspective, the reinforcement of the IPR regime may be expected to contribute to the country's potential to attract, particularly the sectors which employ higher technologies and accordingly have deeper concerns for the theft or unauthorized copying of their production technologies and/or R&D procedures. Field studies that have examined the relationship between IPR and FDI confirm these findings.

B - Findings

I. The effect of IPR on FDI volume

During the studies on the experiences of Central and Eastern European (CEE) countries, which had opened up to FDI, Smarzynska (2004) focused on the relationship between IPR protection and the FDI inflows to these countries until 1995. According to Smarzynska's findings, the likelihood of a country, which achieves a 1% increase in the Intellectual Property Rights Index (this particular index is defined by Smarzynska) to attract FDI, increases by 27%. This ratio increases even to 33% in sectors, which are more sensitive about IPR. 'Income per capita', 'population', 'economic reforms', 'legal system', 'privatization process' and 'openness to the world', are among the other variables of the research, which effect FDI inflows. The principal factors, which deter international investors, are 'high corporate tax rates' and 'corruption'.

On the other hand, Lesser (2001), who examined FDI-IPR relationship in developing countries discovered a direct relationship between the protection provided to IPR and FDI inflows. According to Lesser, a one point increase in the Intellectual Property Rights Index corresponds to an increase of USD 1.5 billion in FDI inflows to developing countries. Furthermore, according to Park and Lippoldt (2008), a 1% improvement in the Patent Rights Index generates a 1.6% increase in the FDI stock of the country concerned.

The care shown for the protection of IPR through legislation and implementation has indirect effects on countries' FDI performances as well. This performance is a sound indication that international investors will be treated justly and be protected from unfair competition in the subject country (Smarzynska 2002).

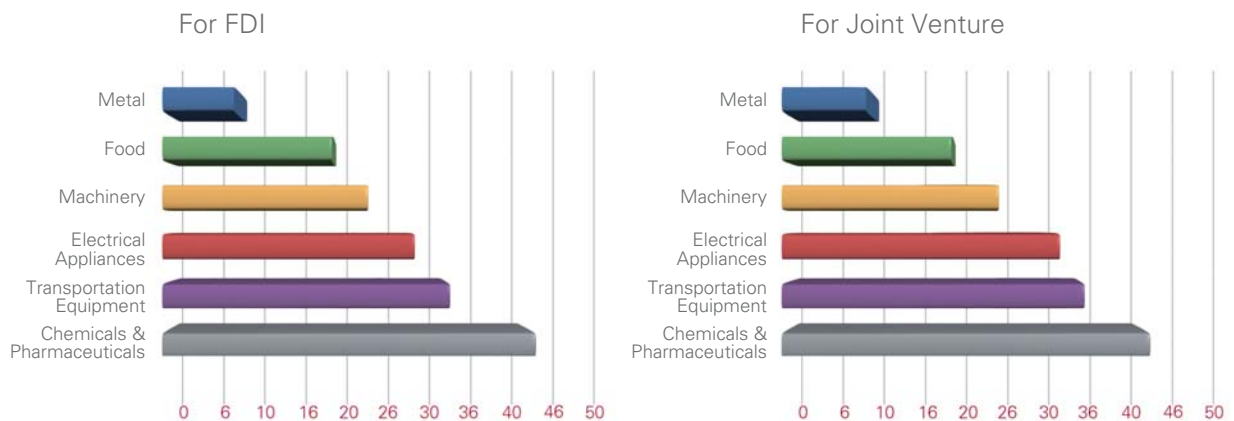
Another factor that affects FDI decisions in this framework is the unregistered economy, since as the size of the unregistered economy in a country increases, the risk of unauthorized copying of the products and technologies to be presented to the market increases too. The vastness of unregistered economy also reveals the insufficiency of the political will and/or administrative capacity that is necessary for struggling with pirated and counterfeit products. The prevalence of the unregistered economy therefore, compels potential investor companies to raise their expectations for the standards involving the protection of their IPR, yet higher. From this perspective, it will not be possible in the presence of a high degree of unregistered economy, to invest in a sector for which the IPR protection level would normally be considered satisfactory for attracting FDI, in the absence of a sizeable informal economy, unless IPR protection is strengthened further or the size of the unregistered economy is reduced.

II. The effect of IPR on the sectoral distribution of FDI

In addition to the amount of inward FDI flows, the IPR protection performances of countries also affect the sectoral distribution of these inflows. The findings in this regard demonstrate that there are differences between sectors concerning the approach to IPR and the significance given to IPR protection in investment decisions.

Chart 2 illustrates the results of a survey made among the executives of USA-based companies, which have investments in Argentina, Brazil, Chile, Hong Kong, India, Mexico, the Philippines, Singapore, South Korea, Taiwan, Thailand and Venezuela. 94 companies, which participated in the survey, were asked if the IPR regime in the countries concerned was satisfactory or not for investing. Whereas 43% of the companies operating in the chemicals sector (pharmaceuticals industry inclusive) have answered that the IPR regimes in the subject countries were not satisfactory for FDI, 42% have stated that the regimes were not satisfactory for joint venture investments. In the food sector however, whereas only 6% of the companies have stressed that the significance given in these countries to IPR protection was unsatisfactory for FDI, 8% have stated that the situation is unfavorable also for JV investments.

Chart 3: Significance given by US companies to IPR protection in the countries they plan to invest in - by sectors. The ratio of those which think that IPR protection is insufficient for investing



Source: Lee and Mansfield (1996)

A similar study was conducted with data from 1400 companies, which had invested in Central and Eastern European (CEE) and CIS countries in the period 1989-1994 (Smarzynska 2004). The results of the study demonstrate differences between sectors as well. Pharmaceuticals, software, cosmetics and health products, chemicals, machinery and electrical equipment sectors are the leading industries where the level of protection of intellectual property is more highly weighed in investment decisions.

What is the reason behind this difference in the significance given by different sectors to IPR protection in the countries to be invested in, during their investment decisions? It might be asserted that this awareness is directly correlated with the significance of the intangible assets of the companies, which are protected by IPR. Companies or sectors, in which the value of such intangible assets is high, give more significance to IPR protection in the countries they plan to invest. For instance, cross-border investment decisions in sectors such as metal industry, food, distribution services and tourism develop according to the market potential and input costs of the target country. The influence of the effectiveness of the IPR regime on cross-border investment decisions is limited in these sectors. On the other hand, IPR do not play a very important role also in companies and sectors, where unauthorized copying of the production technology is costly. The effectiveness shown by the target country for IPR protection however, is very important for companies who possess technologies and products such as chemicals, pharmaceuticals, and software, which can be copied relatively easily.

III. The effect of IPR on the characteristics of FDI

In countries where IPR protection is ineffective, international investors choose to invest in sales and distribution based operations instead of production operations.

Conversely, international companies increase their technology investments in response to the countries, which strengthen their IPR regimes.

The significance given to the protection of IPR affects the characteristics of FDI in addition to its volume and sectoral distribution. Studies demonstrate that in countries, where IPR protection is ineffective (regardless of sectoral characteristics), international investors choose to invest in sales- and distribution-based operations instead of production. Conversely, international companies increase their technology investments in response to the countries, which strengthen their IPR regimes.

According to Smarzynska (2004), who studied the FDI inflows to Central and Eastern European countries, the weakness shown in IPR protection deters investor companies from investing in the production phase, and drive them to make their potential investments in sales and distribution operations. This finding is relevant for all all sectors, without exception. According to Smarzynska's findings, one point increase in the Intellectual Property Rights Index² increases the likelihood of international investors to invest in production, instead of sales and distribution operations by 57%, once these investors take the decision to invest in a country. Correspondingly, a one point drop in this index increases the likelihood of international investors to shift from production to sales and distribution operations by 57%. From this perspective, the deficiencies in IPR protection not only deter FDI inflows, but emerge as a factor which also fuels imports.

Another study which confirms Smarzynska's findings is the survey made by Mansfield (1994) among USA-based companies, which had invested overseas. In this study, Mansfield examines the significance of IPR according to different investment types. The chart below illustrates the significance given to IPR protection with respect to the sectors invested and the characteristics of investment. Chart 3 demonstrates the percentage of companies, which state that the protection provided for IPR in the country to be invested in, is effective on the investment decision. For instance, in the chemicals and pharmaceuticals sector, whereas 19% of the companies take the IPR situation into account prior to the investment decision for distribution and marketing investments, this ratio rises to 87% for production of end-products investments and to 100% in R&D investments.

Chart 4: The percentage of US companies which take IPR protection into consideration when taking investment decisions for different sectors and investments

	Distribution & Marketing	Simple production & assembly	Production of Parts	Production of end products	R&D Facility	Average
Chemicals & Pharma.	19	46	71	87	100	65
Transportation Equip.	17	17	33	33	80	36
Electrical Equipment	15	40	57	74	80	53
Food	29	29	25	43	60	37
Machinery	20	40	50	50	80	48
Metal	23	23	50	65	77	48
Average	20	32	48	59	80	48

Source: Maskus (1998)

IV. The effect of IPR on technology transfers

Strengthening of IPR speeds up the technology transfers of transnational corporations, which have already invested in a country.

It is observed that strengthening of IPR speeds up the technology transfers of transnational corporations, which have already invested in a country. The technology content of production in the invested country consequently increases, and production and exports shift to higher-technology products. According to the findings of Branstetter et al. (2007) who has examined the effect of the reforms made in the IPR regimes in 16 emerging markets - including Turkey - the following changes have been observed in these countries after IPR reforms:

- ~ The USA-based companies operating in these countries have transferred technologies from their mother companies and moved towards technology-intensive production. It was observed consequently that the subsidiaries started exporting products, which they had not ever exported before. 21% of the exports on average made after the reform consist of products not exported previously.
- ~ Capital investments have increased by 11% in the companies surveyed, as a consequence of this transformation of the production structure. This ratio approaches 20% in sectors (chemistry, pharmaceuticals, electrical appliances, mechanical equipment) utilizing high technologies.
- ~ A similar increase is observed in wages and salaries too. The pay increase rate has been calculated as 12% on the whole, and 20% for high-technology utilizing sectors, after the IPR reform.
- ~ Lastly, it was observed that the added-value generated by the manufacturing industry has increased by 11% following this reform, and that this added-value was concentrated in high-technology utilizing sectors.

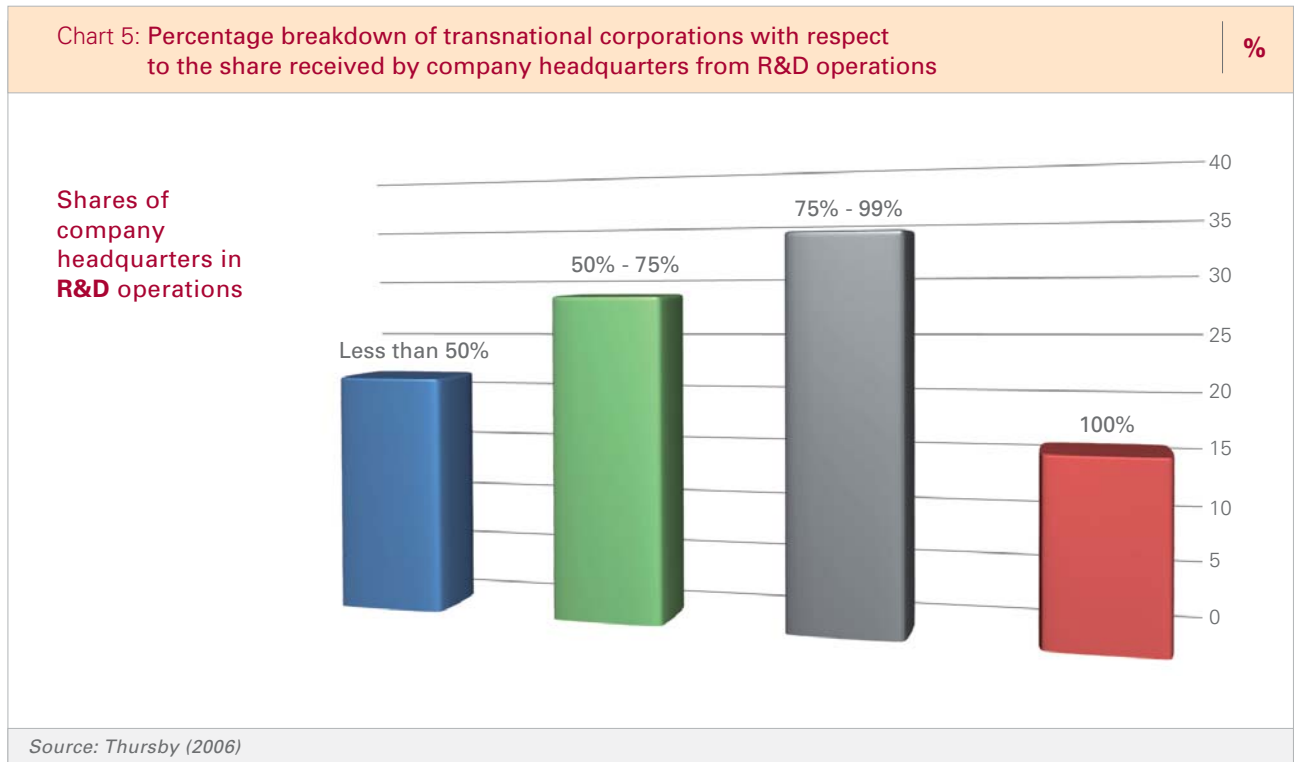
Mansfield (1994) had reached a similar conclusion in previous years. According to Mansfield's findings, technology transfers made by transnational corporations to their subsidiaries operating in different countries are closely correlated with the IPR protection performance of the country in which the subject subsidiary is operating. Whereas relatively newer technologies are transferred to countries where protection levels were higher, countries with lesser protection levels can only benefit from older technologies.

So, the effect of strengthening the IPR system does not remain limited with new FDI inflows, but it also promotes existing international investors to head for higher-value added and higher-technology oriented production. The production technology of the country is thus renewed and updated.

V. The effect of IPR on R&D investments

The priority given to the protection of IPR is also of great consequence regarding prospective R&D investment inflows. R&D activities in the beginning, concentrated mostly at the headquarters of transnational corporations. These investments shifted to other countries only recently. As a matter of fact, only 16% of transnational corporations' R&D expenditures were spent in 2003 by their subsidiaries located outside the countries, where the mother companies' headquarters are situated at. Ten years ago this ratio was less than 10% (UNCTAD 2005). Correspondingly, the percentage of companies, which carry out their R&D activities exclusively at their company headquarters, among 200 transnational corporations interviewed for a research made for the US National Academy of Sciences, was declared as only 15% (Chart 4). In the pharmaceuticals industry, this proportion rises to 40% in clinical studies, where the effect of IPR is relatively smaller, but does not exceed 15% in basic R&D activities, where IPR are very critical. Under these conditions, the countries which long for FDI inflows have started competing with each other for attracting R&D investments too. Many countries therefore implemented R&D incentive programs.

On the other hand, although R&D incentives are important, they are not sufficient for attracting the R&D investments of international companies. Studies confirm that there is a very close correlation between R&D

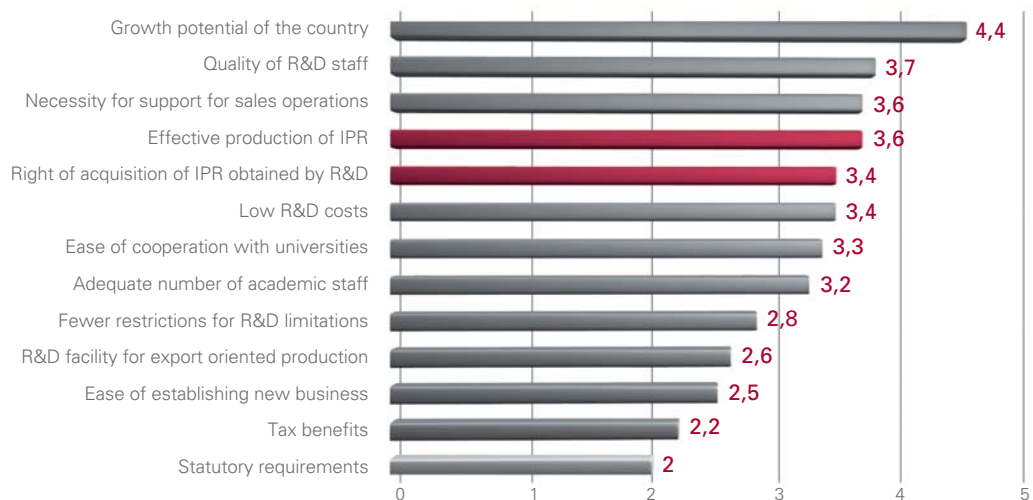


- ❏ There is a very close relationship between R&D investments and the IPR regime.
- ❏ The IPR protection performances of candidate countries play a critical role in the decision process carried out at transnational corporations for selecting the countries to which R&D investments will be directed.

investments and the IPR regime. In other words, IPR protection performances of candidate countries play a critical role in the decision process carried out for selecting the countries to which R&D investments will be directed.

The findings of a study (Thursby 2006), published by the US National Academy of Sciences contain up-to-date data on this issue. The R&D investment policies of 200 transnational corporations operating in 15 different sectors and the factors that affect the destination choices for R&D investments were examined during this study. The results were classified according to whether the destination of the potential investment is a developing country or not. Accordingly, the key factors for a transnational corporation planning to invest in a developing country are; the quality of the R&D staff and the cooperation facilities with universities. Then come the growth potential of the market and the cost of the investment. The weakness of the IPR regime is the major factor that affects the investment decision adversely. In other words, the lack of sufficient care for IPR protection plays a deterring role for R&D investment inflows to the subject country, even in the presence of constructive factors.

Chart 6: Factors taken into consideration by transnational corporations in the location decision of their R&D operations - (over 5 points)



Source: Thursby (2006)

III. Protection of Intellectual Property Rights, FDI and General Economic Effects

There is a close correlation between IPR protection and countries' economic performances. Countries' IPR systems affect their growth, technological transformations, FDI performances, export and employment capacities and prosperity potentials. This section will focus on the effect of IPR on these economic variables, and the following section one will evaluate the impact of an improved IPR protection regime on Turkey's economic performance.

A - Growth

Before taking up the relationship between IPR and economic growth, it would be useful to review the drivers of economic growth. Growth has two different sources, namely capital and labor. To put it very plainly, these two factors have to be utilized in larger quantities and more productively in order to attain growth. Whereas one growth dynamic is based on labor and capital stock increase, the other is based on productivity. The contribution of these two fundamental dynamics to growth varies according to the characteristics of economies concerned. While growth performance is achieved, particularly in developing economies through fixed capital investment increases, in developed economies efforts are exerted to increase growth rates by increasing productivity. The most stable and sustainable growth trends are observed in economies, which utilize these two fundamental dynamics simultaneously. For instance, the performance demonstrated by the US economy since the beginning of this decade fits this pattern. Growth in the US was a result of two factors; the productivity increase triggered by the IT industry and increasing fixed capital investments.

Chart 7: Sources of growth in some OECD countries

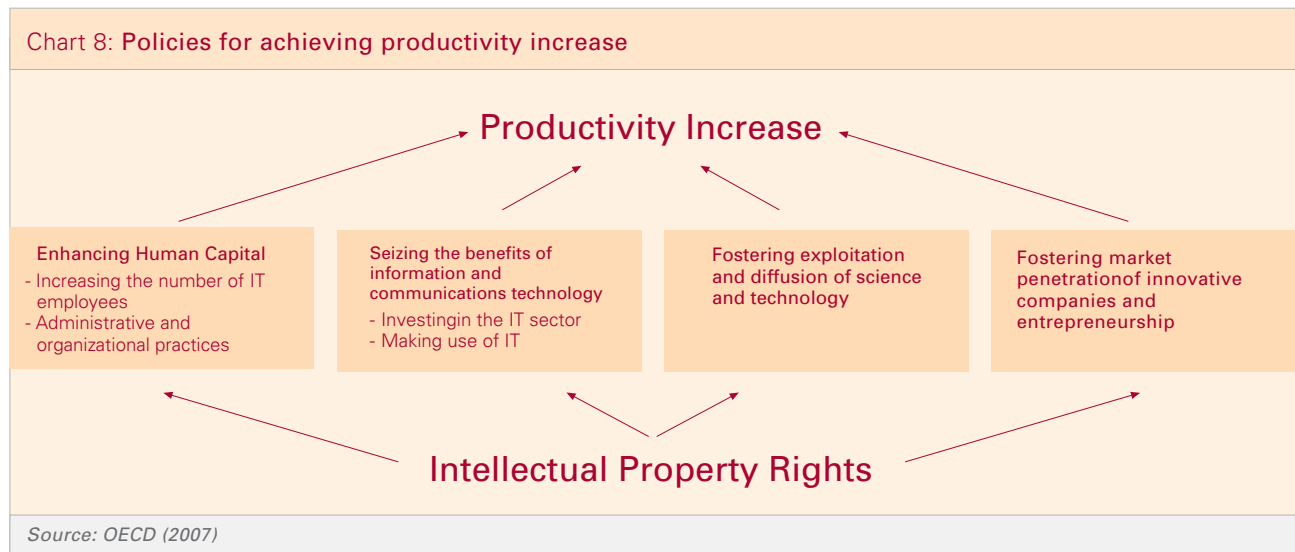
Countries and Periods	GDP Growth (Yearly average)	Contribution of Capital Stock	Contribution of Employment	Contribution of TFP
USA (1970-2000)	3,06	33,8	40,5	25,1
Canada (1970-2000)	3,21	30,4	49,0	18,7
Japan (1970-2000)	3,45	62,2	12,2	26,0
Belgium (1970-2000)	2,56	36,8	5,8	57,0
Denmark (1970-2000)	2,49	23,5	14,4	61,7
Finland (1970-2000)	3,10	30,0	0,4	69,3
France (1970-2000)	2,62	44,7	-8,0	63,2
Germany (1992-2000)	1,71	52,7	-15,9	64,2
Italy (1980-2000)	1,55	55,4	9,5	35,3
Sweden (1979-2000)	2,18	29,9	4,9	63,5
Turkey (1972-2000)	4,02	72,3	21,0	6,5

Source: Saygılı and Cihan (2008). TFP stands for Total Factor Productivity.

The chart demonstrates from the historical perspective that growth dynamics of Turkey has been fairly different than of other OECD countries. The driving force behind growth in Turkey had been capital stock increases and this was supported by employment increases - at least between 1972-2000. The contribution of total factor productivity - an indicator demonstrating how efficiently the production factors are being used - has remained at a low level, i.e. 6.5%. Saygılı and Cihan have studied this phenomenon in detail and updated it in a new study of theirs. According to the findings of this new study, which covers the period between 1988-2007, the respective contributions to Turkey's growth were 86.6 % for capital stock increases, 9.6 % for employment increases, and merely 3.8 % for Total Factor Productivity (TFP) increases. This conclusion points out to a

structural deficiency in Turkey's economy. Growth of Turkey's economy depends on the increase of physical investments. It is not possible however to attain a dynamic and sustainable growth performance like this on the long-run, because of decreasing marginal productivity of capital investments. Therefore, policies, oriented at increasing the total productivity of the economy are necessary. Otherwise it will not be possible for Turkey to increase its long-term average growth rate, which was calculated as 4% by Saygılı and Cihan. A long-term sustainable growth indispensably necessitates the increase of economy's total productivity.

OECD's working paper titled "Micro-policies for Growth and Productivity" (OECD 2007) lists the areas to be focused on for productivity increase as; "Enhancing Human Capital", "Seizing the benefits of information and communications technology (ICT)", "Fostering exploitation and diffusion of science and technology", and "Fostering market penetration of innovative companies and entrepreneurship".



Policies aimed at achieving productivity increases are closely correlated to IPRs. In other words, in all the areas highlighted by OECD, on account of the significance they carry for economic productivity (i.e. Enhancing human capital by increasing the number of CIT workers; Seizing the benefits of CIT; Fostering exploitation and diffusion of science and technology; Fostering market penetration of innovative companies and entrepreneurship), improvements are possible only in the presence of a powerful and effective IPR system. From this perspective, IPR have become the indispensable requirement for total productivity increases, which provide stable and sustainable prosperity increases to economies.

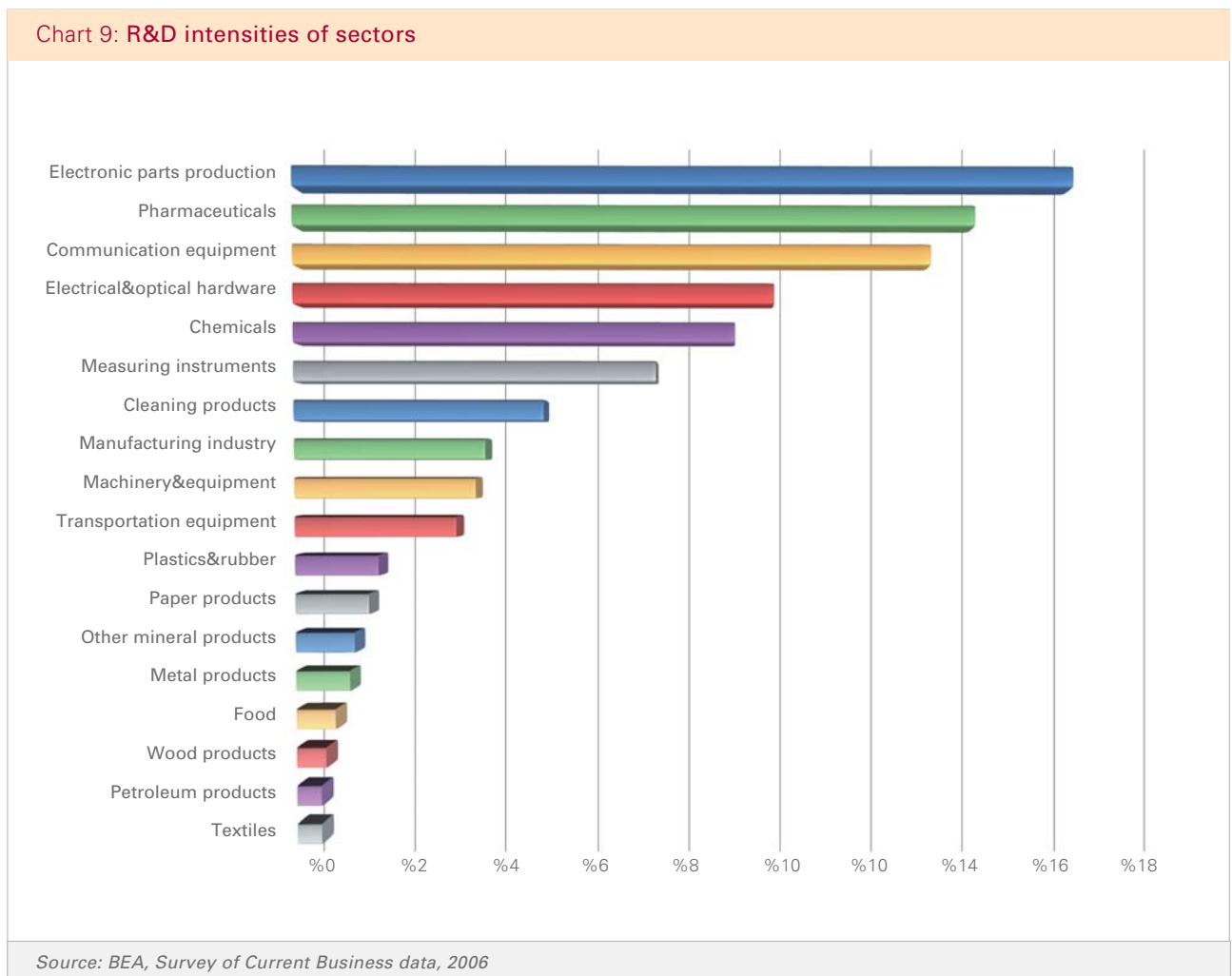
This conclusion, which is valid for developed economies, is also of consequence for Turkey's economy, since Turkey's road to higher performance on the long-run, goes through productivity increase. This necessitates a powerful and effective IPR system. In order to embody this cause and effect relationship, it would be useful to analyze the relationship between IPR and applications, which will increase the total productivity of the economy, such as technological development, informatics sector investments, in more detail.

- ❏ Public policies aimed at achieving productivity increases are closely related to IPR.
- ❏ IPR protection has become the indispensable requirement for total productivity increases, which provide stable and sustainable prosperity increases to economies.

B - Technological infrastructure and IPR

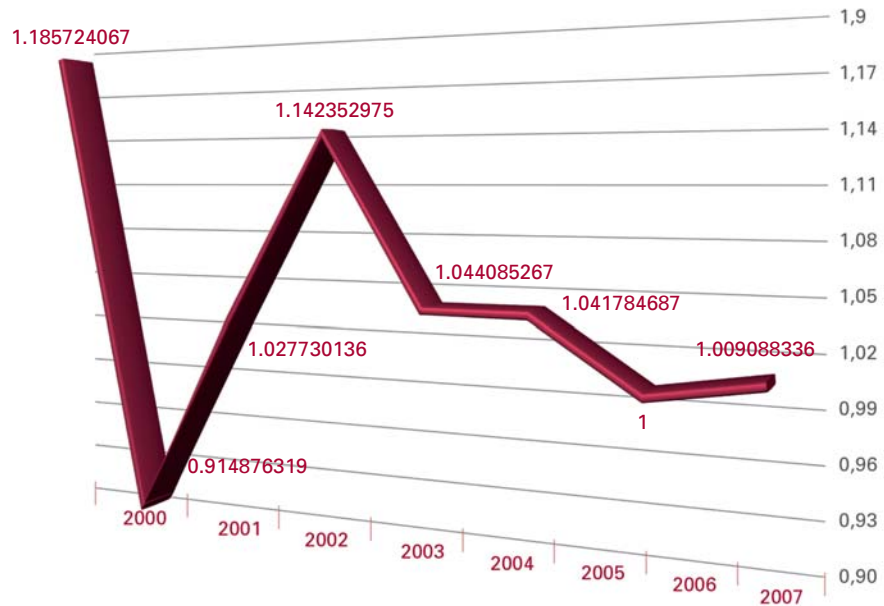
The role IPR protection plays in the reinforcement of the technological infrastructure in a country was already mentioned in the earlier pages of this report, and it was emphasized that particularly companies using technologies, which can be copied, avoid from investing in countries having problems with IPR protection. It would be proper to state at this point that Turkey is faced with a similar problem. It is evident that Turkey experiences difficulties in accomplishing a technological transformation upon which it could build a long-term productivity increase. This conclusion can be reached more easily when the breakdown of FDI inflows to Turkey's manufacturing industry since 2000 (see Chart 10) is examined.

The chart below demonstrates the ratio of R&D spending to total sales revenues, which is an indicator of the technological contents of various sectors. The subject data was gathered from the balance sheets of overseas investments of US-based companies by US Bureau of Economic Analysis.



A Technology Index for FDI has been generated, with the purpose to examine whether Turkey would be able to accomplish its technological transformation particularly by means of FDI; by multiplying the global R&D intensity values of various sectors - obtained from US data - by the shares of these sectors in Turkey's FDI stock. The reference-value and base-year of the index were taken as 1.0 and 2006. The development of the subject index as follows:

Chart 10: FDI Technology Index



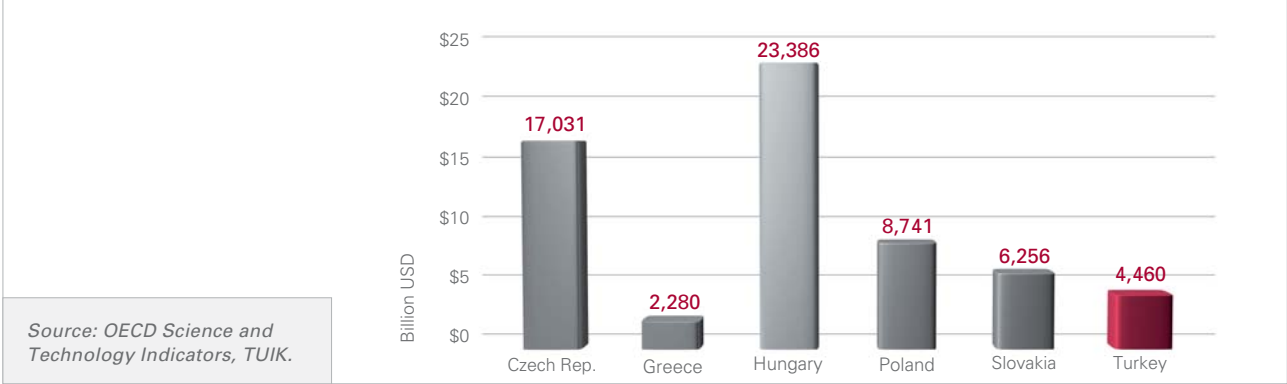
Source: Calculations by Istanbul Economics based on Undersecretariat of Treasury data

A review of the breakdown of FDI - the basic method of technological transfers - since year 2000, reveals that FDI inflows to Turkey were not steered towards high-technology content areas. Furthermore, the breakdown of the FDI stock in 2007 is not as good as the breakdown of the FDI stock of 2000, regarding technological intensity³. This conclusion should not be interpreted as FDI in the manufacturing industry not having made technology transfers to Turkey in the 2000s. This analysis only demonstrates that Turkey has comparatively failed in attracting FDI to technology intensive sectors. For example, the FDI Technology Indexes for the year 2006 were calculated as 1.39 and 1.09 for Hungary and the Czech respectively. In other words, the technological intensity of FDI in Hungary was 39% higher than Turkey's.

- ❑ Turkey has failed in attracting FDI to technology intensive sectors.
- ❑ Turkey's relative weakness of performance in attracting FDI to technology intensive sectors affects its export potential adversely as well.

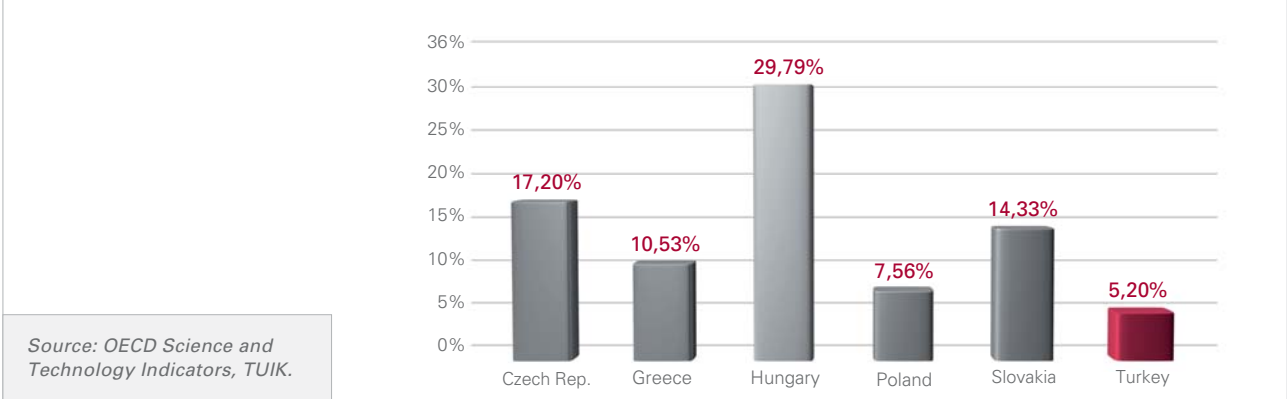
Turkey's relative weakness of performance in attracting FDI to technology intensive sectors also affects the country's export potential adversely. The important point for a country like Turkey, suffering from a chronic current deficit problem, is the effect of the sectoral breakdown of its FDI stock on foreign trade balance. The chronic trade deficit essentially nourishes on the import dependency of the industry. A sustainable decrease in the trade deficit necessitates the industry's import dependency to be reduced and consequently its technological content to be increased. In this connection; when the technological content of exports is examined in OECD-based statistics, it can be seen that Turkey is considerably behind its competitor countries.

Chart 11: High technology exports (2006)



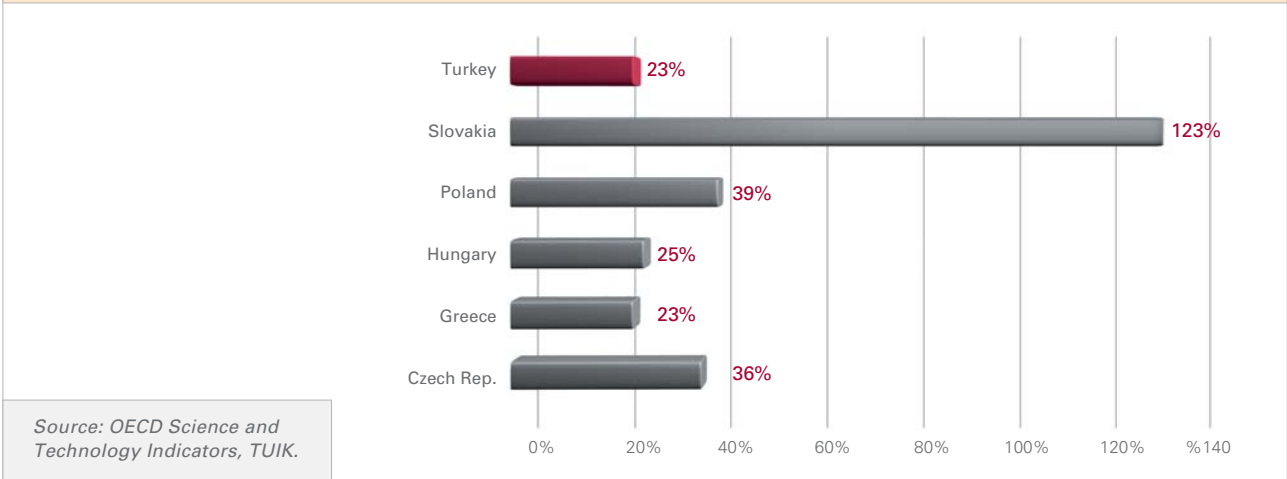
A similar picture appears, when one looks at the share of high-tech products in total exports.

Chart 12: Share of high technology products in total exports (2006)



It is also not possible to assert that Turkey's unfavorable position in this area is improving rapidly. The rate of increase in Turkey's technological product exports ranks lowest among similar countries during the last five years.

Chart 13: Average rate of increase in high technology exports during 2002-2006



At the base of these significant differences lies the IPR protection issue. Better protection of IPR assists countries in channeling FDI inflows to higher added-value generating sectors. The key to tackling Turkey's chronic trade deficit also lies here. The cure is to cause FDI to head for sectors with higher technological content, which are also less import dependent, by improving the IPR protection system.

- ❏ Better protection of IPR assists countries in channeling FDI inflows to higher added-value generating sectors.
- ❏ The key to Turkey's chronic trade gap issue also lies here.
- ❏ The cure is to incentivize FDI to head for sectors with higher technological content, which are also less import dependent, by improving the IPR protection system.

It was highlighted in previous sections that the significance laid on effective protection of IPR increases as the technological content of FDI enriches. This correlation is obviously of great consequence for Turkey, for transforming its industry and enriching its technological content. Turkey's unsatisfactory performance in IPR protection stands as a barrier also in front of technology imports through FDI. Improving IPR protection will definitely facilitate Turkey to attract further FDI to sectors with higher technology content.

Another factor, which is linked to the effectiveness of the IPR system and which also affects the general productivity of the economy, is the issue of investments in information technologies.

C - Information technologies, productivity and IPR

It is known that there is a close correlation between the breakdown of countries' FDI and capital stocks and their growth potentials. For instance, it is pointed out that returns would be higher if investments would focus particularly on informatics, communication and information technologies in addition to machinery and equipment (Colecchia et al. 2002). The reason is the multiplier effect of these sectors, which spread over the entire economy and generate productivity increases. Investments in informatics and information technologies increase general economic productivity by helping companies to enhance their organizational structures, benefit from network economies and gain easier access to information. Research has therefore been made in many countries on the returns of investments made in the IT sector with the objective to establish policies that will provide growth, by ascertaining the correlation between IT investments and economic productivity. In this framework, a recently published research on the US economy has set out the constituents of the labor productivity increase witnessed in this country since 1973.

During the 1995-2000 period, in which labor productivity increase gained momentum in the US, the ratio of the IT sector in labor productivity increase had climbed to 70%. In other words, 70% of growth stemmed from the investment increase in the IT sector and the productivity boosting effect of this increase. Actually, IT investments are accounted for the rise of the annual productivity increase rate in the US economy, from 1.5%

Chart 14: Components of the increase of labor productivity the US economy

Labor productivity increase (annual average)	1973 - 1995 % 1.47	1995 - 2000 % 2.51	2000 - 2006 % 2.86
<i>Components and pro rata contributions</i>			
Capital stock increase	0.76	1.11	0.85
<i>Capital stock increase in the informatics sector</i>	0.46	1.09	0.61
Computer hardware	0.25	0.6	0.28
Software	0.14	0.34	0.2
Communications systems	0.07	0.15	0.13
<i>Capital stock increase in other areas</i>	0.3	0.02	0.24
Improvement of labor quality	0.27	0.26	0.34
Total factor productivity increase	0.44	1.11	1.68
<i>Sectors utilizing informatics</i>	0.28	0.75	0.51
Semiconductors	0.08	0.45	0.23
Computer hardware	0.12	0.19	0.1
Software	0.04	0.08	0.13
Communications systems	0.04	0.03	0.05
<i>Other sectors</i>	0.16	0.36	1.17
Total contribution of software sector	0.18	0.42	0.33
Total contribution of software sector (pro rata)	12.24%	16.73%	11.54%
Total contribution of informatics sector	0.74	1.84	1.12
Total contribution of informatics sector (pro rata)	50.34%	73.31%	39.16%

Source: Oliner et al. 2007

to 3.0%. Similar results have been obtained for EU countries as well⁴. During the 1995-2001 period, the contribution of the increase in the investment stock in the IT sector, in the annual labor productivity increase rate, which was 1.37%, was calculated as 0.43%. In other words, 30% of the growth enjoyed by EU countries originated from the increase of investments made in these areas⁵.

On the other hand, it is rather interesting here to notice that the difference between growth performance rates of the US and the EU economies have widened in US favor, even though the increase rates enjoyed by their individual IT sectors are comparable. The primary reason of this is the fact that the share of the IT sector in the capital stock is larger in the US as compared to the EU. The second reason, on the other hand, is that a momentum in productivity increase cannot be gained, unless fixed capital investments in the IT sector reach a certain scale. In other words, time is necessary for information technologies first to disseminate in the national economy. The return of investments in the IT sector increase progressively after a certain dissemination threshold. But once the penetration of information technologies reaches high levels, the contribution of investments in the IT sector drops start decreasing, as witnessed in the US economy in recent years.

One can easily assert in the light of the sizeable effect of the IT sector on economic performance, productivity increase and consequently growth, that public authorities should focus on policies to increase the share of IT investments within the entire capital stock of the economy. The major barrier to investment increases in

The effect of the IT sector on economic performance, productivity increase and consequently growth is substantial.

Public policies should focus on increasing the share of IT investments within the entire capital stock of the economy.

The major barrier to investment increases in this sector is the shortages in IPR protection.

IT sector is an area, where IPR violations are experienced most intensively in Turkey.

this sector are the deficiencies in IPR protection. IT sector is an area, where IPR violations are experienced most frequently all over the globe. Computer software rank first among the most commonly counterfeited products, according to European Communities Trade Mark Association (ECTA) with 35%; audio and video CDs follow with 25%, and textile products rank third with 22%.

The degree of IPR violations and counterfeiting faced by the software sector in Turkey is almost double of the world average. According to the results of a comparative study made in 43 countries by International Data Corporation (IDC) in 2007, the ratio of counterfeit software used in Turkey is 64%. In other words, 64 of every 100 computer programs installed in the PCs are counterfeit and unlicensed.

It is needless to mention that there are significant barriers in front of this sector, where the frequency of IPR violations is so much above the world average, to impede it from developing and attracting FDI. This is most unfortunate since, the software and IT services sector is one of the principal sectors, which retain considerable development potential with the trained human capital Turkey possesses in this industry. R&D incentives and a number of public policies, which encourage cooperation between

universities and the industry, have been put into force, with the objective to support the development of these sectors. Satisfactory results could however not be achieved from these policies until today, and the software sector in Turkey has not grown enough to meet the expectations. The size of the sector only reaches 0.2% of GDP⁶. For reference, this ratio is 1% in India.

If IPR were protected more effectively, this would, in addition to contributing to the development of the sector, also affect the overall productivity of the sector positively. According to IDC's study, if the usage of counterfeit software can be reduced from 66% down to 56%, this would generate 3,000 new jobs in the IT technology sector in addition to 36,000 positions in other sectors, and cause the economy to grow by USD 1 billion in 4 years, and contribute to the generation of an additional tax revenue amount of amounting to USD 600 million.

Probably the most harmful effect of the deficiencies in IPR protection, which adversely affect the development of the software and IT sectors and potential investments to these sectors, has been; putting at risk the prospect of testing also in Turkey, the growth rate increase - which would gain momentum in line with the overall productivity increase that would come into being following a certain penetration rate to be reached after the investments made in these sectors. In other words, as long as the deficiencies in IPR protection, which discourage potential investors from investing in these sectors, are not removed, there is a risk for Turkey to fall short of its potential growth rate.

Consequently, protection of IPR carries great significance regarding economies' growth performances, because effective protection of IPR has become a requirement for implementing the public policies recommended for total productivity increases. This conclusion befits particularly Turkey's economy, which has fallen behind other European economies in total productivity increase, and is compelled to close this gap and improve its long-term average growth rate.

IV. Protection of Intellectual Property Rights in Turkey and FDI: Comparative Data

Before starting to analyze the relationship between IPR protection and FDI in Turkey, it would be useful to review Turkey's performance both in IPR protection and FDI.

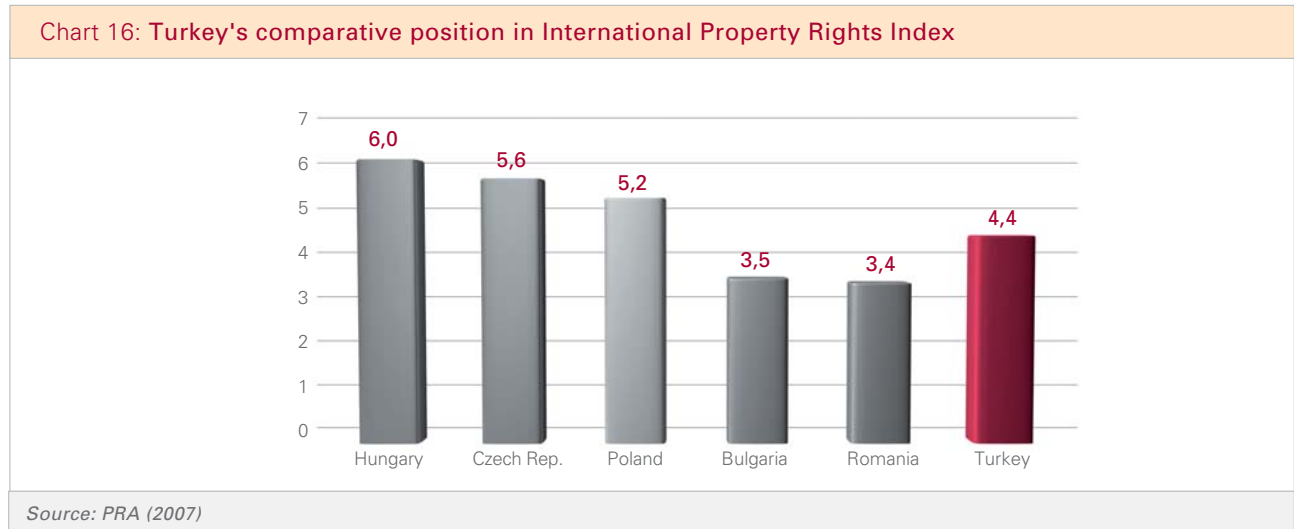
A - IPR protection in Turkey

The most up-to-date study which enables international comparisons in IPR protection is the study published by PRA in 2007 (PRA 2007). An index, which demonstrates countries' IPR protection performances, has been constructed in this study, by making use of a number of indicators⁷, and countries were ranked according to this index. Turkey ranks 44th among the 70 countries included in the study. While Germany is at the top of the list with 8.8 points, Turkey's score is 4.4 points.

Rank	Country	IPR Index	Rank	Country	IPR Index
1	Germany	8.8	36	Brazil	4.9
2	Austria	8.6	37	Tanzania	4.8
3	Finland	8.6	38	Colombia	4.5
4	Australia	8.3	39	Mexico	4.5
5	United Kingdom	8.3	40	Argentina	4.4
6	Denmark	8.2	41	India	4.4
7	France	8.2	42	Panama	4.4
8	Japan	8.2	43	Thailand	4.4
9	Netherlands	8.1	44	Turkey	4.4
10	Belgium	8.0	45	Philippines	4.3
11	United States	8.0	46	Costa Rica	4.1
12	Norway	7.9	47	Honduras	4.0
13	Switzerland	7.8	48	Indonesia	4.0
14	New Zealand	7.7	49	Uruguay	4.0
15	Ireland	7.6	50	Ukraine	3.9
16	Singapore	7.6	51	Dominican Republic	3.8
17	Sweden	7.6	52	Egypt	3.7
18	Canada	7.5	53	Lithuania	3.7
19	Korea(South)	6.8	54	Morocco	3.7
20	South Africa	6.8	55	Russia	3.7
21	Hong Kong	6.7	56	Ecuador	3.6
22	Israel	6.6	57	Bulgaria	3.5
23	Italy	6.6	58	China	3.5
24	Spain	6.6	59	Romania	3.4
25	Portugal	6.4	60	Nigeria	3.3
26	Mauritius	6.1	61	Kenya	3.2
27	Hungary	6.0	52	Nicaragua	3.1
28	El Salvador	5.8	63	Venezuela	3.1
29	Czech Republic	5.6	64	Peru	2.9
30	Malaysia	5.6	65	Pakistan	2.8
31	Chile	5.3	66	Bangladesh	2.7
32	Tunisia	5.3	67	Paraguay	2.6
33	Greece	5.2	68	Guatemala	2.3
34	Poland	5.2	69	Bolivia	2.2
35	Malawi	5.0	70	Ethiopia	2.2
	World Average	5.4			
	North America	6.7			
	Middle East/N. Africa	4.8			
	Western Europe	7.6			
	E. Europe/Russia	4.4			

Source: PRA 2007

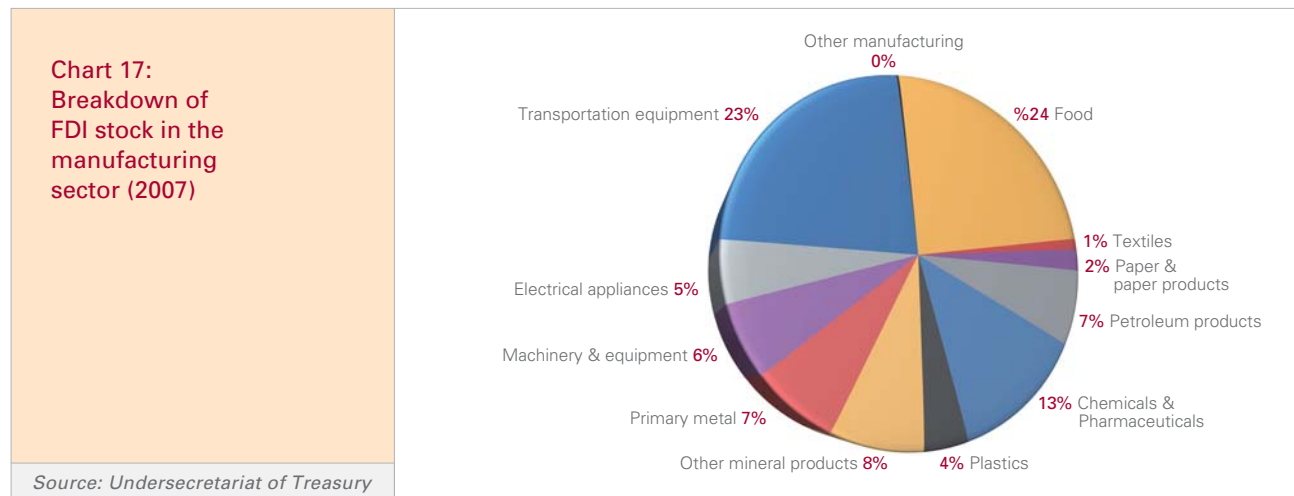
A comparison of Turkey's position in the International Property Rights Index (IPRI) ranking with respect to the other countries in the region, with which Turkey competes for FDI inflows, is given in Chart 16.



Here it can be seen that although Turkey's IPRI is approximately 1 point above the indexes of Bulgaria and Romania, it is 1.5 point below Hungary and 1 point below Czech Republic. So it can be predicted in the light of the analyses made in earlier sections that Turkey will face difficulties in competing with Hungary, Czech Republic and Poland for FDI inflows, because of the comparative weakness of its IPR protection regime, and the characteristics of the FDI it will be able to attract will be lower in technological content, and targeting sales and marketing mostly - poised to increase imports - in comparison with these countries. In other words, Turkey's relatively unsatisfactory IPR protection performance also contradicts the country's goal to become a regional center of attraction for FDI inflows.

B - FDI in Turkey

Before starting our analysis of the relationship between FDI and IPR in Turkey, it would be useful to review briefly the main areas attracting FDI. The sectoral breakdown of FDI stock in Turkey's manufacturing industry, which has reached USD 32 billion as of 2007 end, is as follows:



Multinational companies operating in the manufacturing industry contribute considerably to Turkey's economy. A study made on the basis of 2006 data related to Turkey's Top 1000 companies, published by the Istanbul Chamber of Commerce, demonstrate that the multinational companies on this list have:

- ~ Generated an added value worth TRY 13.7 billion,
- ~ Made exports worth USD 19.7 billion,
- ~ Generated employment for 150,000 people.

But more important than that is the contribution these companies have made to the productivity of the Turkish economy; since the potential of an economy to generate prosperity is closely related to total productivity - more than anything else. The chart below illustrates the productivity rates of multinational companies with respect to different sectors and a comparison of these values with the productivity rates of domestic companies.

Chart 18: Added value generated per employee annually (TRY)			
Sectors	International companies	Domestic companies	Difference
Food Products, Beverages and Tobacco Products Manufacturing	88,508	41,444	114%
Textile and Textile Products Manufacturing	26,431	25,410	4%
Wood Products Manufacturing	31,760	39,561	-20%
Pulp, Paper, Paper Products Manufacturing; Printing and Publishing	108,985	85,087	28%
Basic Chemicals, Chemical Products and Synthetic Fiber Manufacturing	91,005	87,847	4%
Plastic and Rubber Products Manufacturing	107,145	54,681	96%
Nonmetallic Mineral Products Manufacturing	168,712	99,780	69%
Primary Metal and Fabricated Metal Products Manufacturing	101,406	112,209	-10%
Machinery and Equipment Manufacturing	87,578	78,945	11%
Electrical and Optical Equipment Manufacturing	93,211	56,016	66%
Transportation Equipment Manufacturing	140,751	59,543	136%

Source: Calculations by Istanbul Economics based on ISO-1000 (2006) data

It can easily be seen here that the average productivity of international companies are higher than that of domestic ones, except for the primary metal and wood products manufacturing sectors. Furthermore, in paper and food sectors, the average productivity of international companies is more than twice as much of the domestic companies.

Chart 19: Annual exports per employee (USD)			
Sektörler	International companies	Domestic companies	Difference
Food Products, Beverages and Tobacco Products Manufacturing	37,793	29,606	28%
Textile and Textile Products Manufacturing	39,224	37,382	5%
Wood Products Manufacturing	80,833	16,553	388%
Pulp, Paper, Paper Products Manufacturing; Printing and Publishing	42,034	12,657	232%
Basic Chemicals, Chemical Products and Synthetic Fiber Manufacturing	25,034	62,681	-60%
Plastic and Rubber Products Manufacturing	118,989	57,284	108%
Nonmetallic Mineral Products Manufacturing	43,141	34,901	24%
Primary Metal and Fabricated Metal Products Manufacturing	201,852	152,745	32%
Machinery and Equipment Manufacturing	91,836	78,268	17%
Electrical and Optical Equipment Manufacturing	183,109	103,728	77%
Transportation Equipment Manufacturing	223,087	48,351	361%

Source: Calculations by Istanbul Economics based on ISO-1000 (2006) data

A similar reasoning can be made for the export performances of these companies. The chart below gives the values of export per employee in each sector.

It is acknowledged that quite a number of parameters affect the investment location decisions of international companies. Many variables such as political and economic stability, growth potential, development level, market size, openness to the world, trade and competition policies, tax and incentive systems of the destination country are evaluated in country selection, in accordance with the characteristics of the investment to be made. On the other hand, as underlined in the previous pages of this report, the priority to be given to IPR protection affect the volume and characteristics of the inward FDI flows to a country. Stronger protection of IPR is encouraging for channeling investments with higher technology content to production operations. It is therefore possible to assert, under the light of the above findings that protection of IPR will benefit the Turkish economy by causing FDI inflows to increase.

A further step, beyond this general conclusion would be to develop some scenarios for forecasting what general economic effects the strengthening of the IPR regime would have on the attraction of more FDI inflows with diverse characteristics.

V. Protection of Intellectual Property Rights in Turkey and FDI: Forecasts

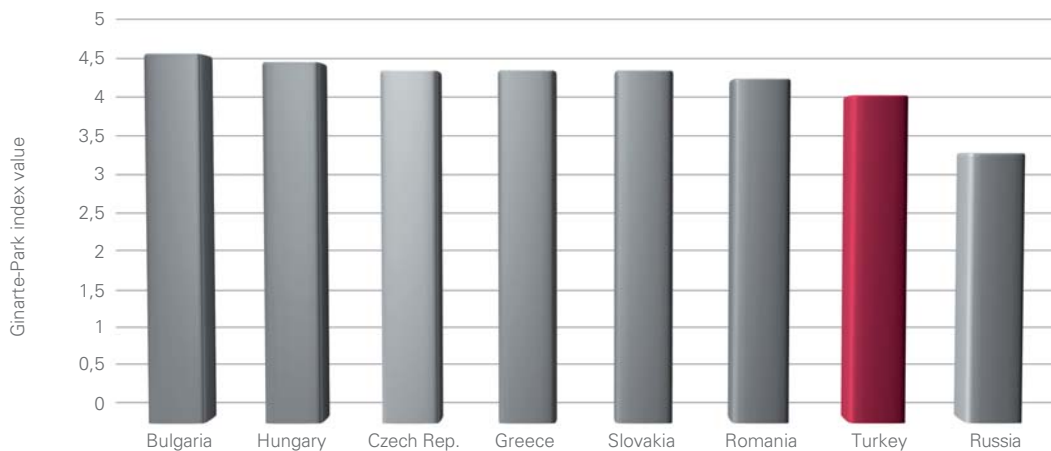
The most up-to-date study that evaluates the quantitative correlation between IPR protection level and FDI inflows, is the research made jointly by Walter Park, who is one of the creators of the Ginarte-Park Index, and Douglas Lippoldt in 2008 (Park and Lippoldt 2008). Ginarte-Park Index is actually an indicator demonstrating both the legislative and practical protection provided for patent rights. According to the results of the subject research; a 1% improvement in the Ginarte-Park Index of Patent Rights would generate a 1.6% increase in FDI inflows to developing countries, including Turkey.

Turkey's Ginarte-Park Index score is 4.00 in the 2005 ranking. This score was 1.80 in 1995 and 2.86 in 2000, since the rating is updated regularly every 5 years. So it can be seen that the legislative and practical protection given to patent rights in Turkey has improved during the last ten years. The Patent Rights Index standings of some other countries, which compete with Turkey for FDI inflows can also be examined on the below chart.

About Ginarte-Park Index of Patent Rights

This index, initially constructed by Ginarte and Park in 1997, is one of the most frequently used IPR indicators. It was lastly updated in 2005. The index scores vary between 0 (worst) and 5 (best). A country's score is obtained by adding up the grades given in 5 different patent rights categories. These are; the extent of coverage of patent protection, membership in international patent agreements, duration of patent protection, potential patent rights limitations, and enforcement mechanisms. The highest grade permissible for any category is 1 point.

Chart 20: Ginarte-Park Patent Rights Index Scores



Although Turkey has achieved considerable progress in IPR protection during the last ten years, it is still behind the countries it is competing with for FDI.

So, although Turkey has achieved considerable progress in IPR protection during the last ten years, it still is behind the countries it is competing with for attracting FDI.

Based on Turkey's ranking on the subject index, a number of scenarios can be generated on the economic results of improvements in IPR protection. For instance, one could investigate the potential effects of a 10% increase in Turkey's index score; i.e. from 4.00 to 4.40. Actually this improvement would make Turkey on par with Hungary regarding the legislative and practical protection given to patent rights. In other words; what would be the general impact of Turkey's enhancement of its patent protection rights regime to the level prevailing in Hungary?

A - FDI volume

According to Park and Lippoldt's model, a 10% increase in the Patent Rights Index of a country generates a 16% rise in the subject country's FDI stock. Accordingly, given that Turkey's FDI stock has reached USD 120 billion as of August 2008, such a development in IPR protection would indicate a potential FDI inflow of USD 19.2 billion. In other words, in case Turkey improves its IPR protection level to that of Hungary, it might attract additional FDI worth USD 19.2 billion.

The effects of this additional FDI on some economic indicators, such as production, added value, exports and employment can also be examined and estimated. The key issue here is how these FDI would flow into the country. For example, multinational companies, which access the Turkish market by acquiring a domestic company, do not generate additional production, employment and export capacity - at least in the short term. Greenfield investments however, generate new production, export and employment prospects. So the effects of new FDI inflows to be promoted through IPR protection can be calculated by estimating the impact of two extreme options; specifically;

In case Turkey improves its IPR protection level to that of Hungary, it might attract additional FDI worth USD 19.2 billion.

- ~ All FDI inflows to the country to come for mergers and acquisitions or real estate purchases,
or
- ~ All FDI inflows to the country to come for new business establishments and capacity enlargements.

These two alternatives can actually be called; the "worst scenario" and the "best scenario" respectively. As a matter of fact, both scenarios are not realistic, but only reflect the impact of the both ends of the extreme assumptions.. Still, the data to be obtained from these scenarios will enable us to estimate the economic effect or contribution the additional FDI inflow would generate under the worst and best conditions. The real situation will fall somewhere in between these two end points. One can examine the ratio of mergers and acquisitions - including privatizations - in total FDI inflows in the previous years, in order to estimate this point.. According to 2007 FDI Report published by the Undersecretariat of Treasury, this ratio was approximately 64% in 2007. Furthermore, 13% of the FDI inflows had gone into the real estate sector. In other words, 77% of FDI inflows had been placed in privatizations, mergers and acquisitions and real estate operations, namely "bad scenario" transactions, which do not enlarge the production capacity - at least in the initial phase. The remaining 23% however, were directed at greenfield investments or capacity enlargements.

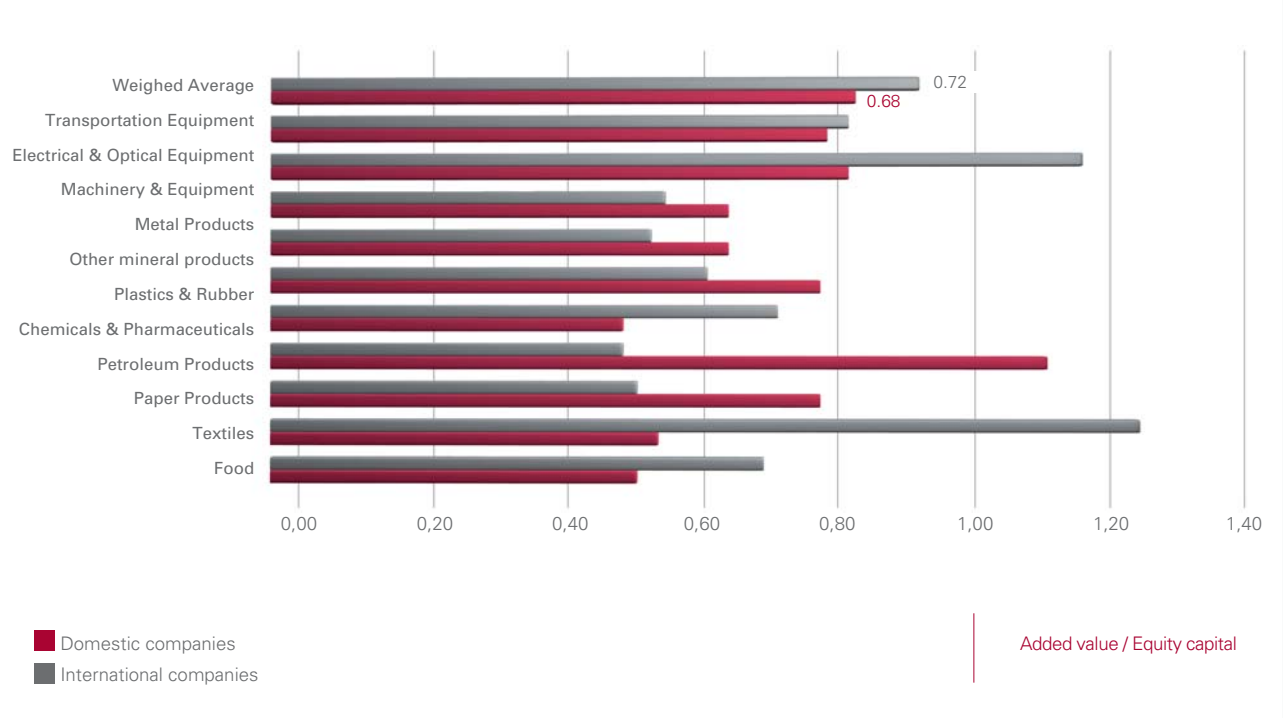
The 2006 Top 1000 Enterprises -2006 data published by the Istanbul Chamber of Industry (ISO) has been used in this study. The companies were grouped as "domestic" and "multinational" with respect to the sectors they

are operating in and the proportion of the added value, employment and export volumes of companies, as a ratio of their equity capital were calculated.

B - Production and added value

Based on ISO 2006 data, the weighed average added-value/equity capital ratio of multinational companies operating in the manufacturing industry has been calculated as 0.72. In other words, the multinational companies operating in the manufacturing industry generate an added value of USD 0.72 in return for every USD 1.0 of their equity capital. This ratio on the other hand, has been calculated as 0.68 for domestic companies. That is to say; there is a 6% difference on the average, between the added-value generation performances of multinational and domestic companies, as can be seen in Chart 18.

Chart 21: Added Value/ Equity Capital ratios of international and domestic companies operating in the manufacturing industry with respect to their sectors.



Source: Calculations by Istanbul Economics based on ISO-1000 (2006) data

Improvement of the IPR system will increase the attractiveness of the manufacturing industry in the eyes of international investors, much more than of the agricultural sector or the services industry.

Accordingly, in case the additional FDI inflow amount of USD 19.2 billion flows into the manufacturing industry, an additional added-value, worth USD **4.4 billion** will be generated under the most realistic scenario.

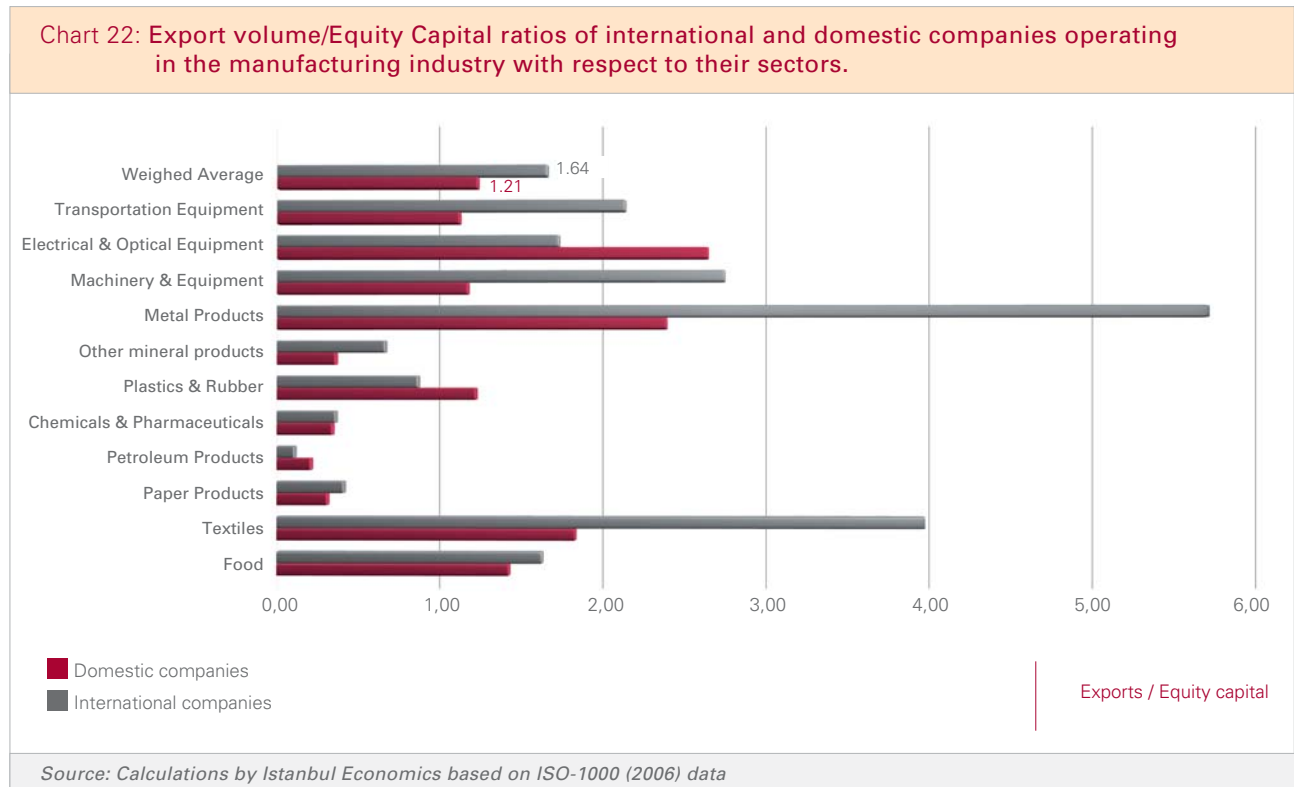
With respect to this data, in case the USD 19.2 billion - the additional FDI inflow amount that might materialize on account of the improvement of the IPR regime - go to the manufacturing industry, the increase in the added value to be generated in the industrial sector and accordingly the rise in the Turkey's national income can be calculated as follows:

- ~ Under the best scenario (all FDI inflows generate capacity enlargements), an additional added value worth; $19.2 \times 0.72 = 13.8$ billion USD;
- ~ Under the worst scenario (all of the FDI inflows head for privatizations, mergers and acquisitions and real estate operations, which do not enlarge the country's production capacity) an additional added value worth; $19.2 \times (0.72-0.68) = 768$ million USD;
- ~ Under the most realistic scenario (23% of FDI inflows head for production capacity enlarging operations, but 77% head for operations which do not enlarge the country's production capacity, as in 2007) an additional added value worth $(0.23 \times 13.8) + (0.77 \times 0.768) = 4.4$ billion USD added value might be generated annually.

The USD 4.4 billion amount, calculated under the most realistic scenario, corresponds approximately to 0.7% of Turkey's national income. In short, it can be predicted that in case Turkey improves its IPR protection level on par with Hungary, this would produce approximately a 0.7 % increase in the country's GNP. This estimate however, takes into account only the initial and direct effects of the FDI stock increase, and does not take into consideration the other chain effects of the increase of the capital accumulation in the national economy which will surface over time. In other words, the additional investments to be made with the revenues made by those, who have sold their companies, are not taken into consideration.

C - Exports

The weighed average ratio of the export volume generated by multinational companies operating in the



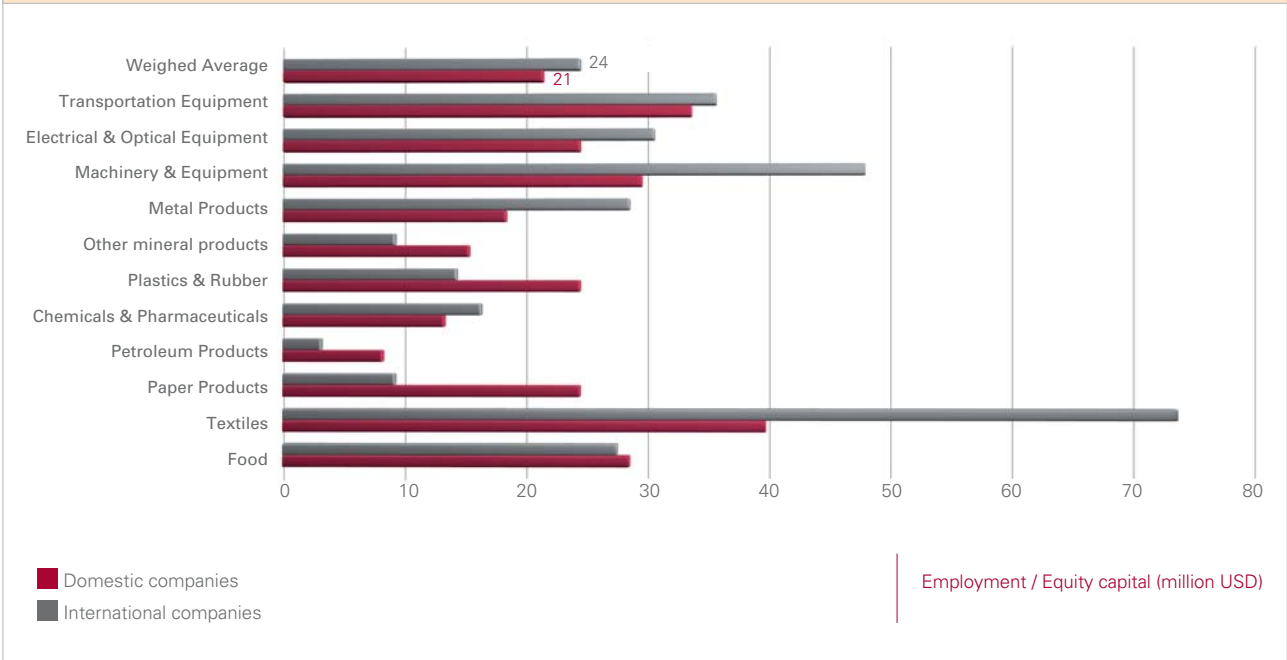
manufacturing industry, to their equity capital (i.e. export volume/equity capital) has been calculated as 1.63. In other words, the multinational companies operating in the manufacturing industry generate an added value of USD 1.63 in return for every USD 1.0 of their equity capital. This ratio on the other hand, has been calculated as 1.21 for domestic companies.

With respect to this data; in case the subject USD 19.2 billion - the additional FDI inflows that might materialize on account of improvement in the IPR regime - go to the manufacturing industry, the increase in export volume of manufacturing industry can be calculated as follows:

Under the most realistic scenario, the FDI inflows stimulated by IPR improvements will generate an additional export volume worth **USD 13 billion.**

- ~ Under the best scenario (all FDI inflows generate capacity enlargements), an additional export volume of; $19.2 \times 1.63 = 31$ billion USD;
- ~ Under the worst scenario (all of the FDI inflows head for privatizations, mergers and acquisitions and real estate operations, and do not enlarge the country's production capacity) an additional export volume of; $19.2 \times (1.63-1.21) = 8$ billion USD;
- ~ Under the most realistic scenario (23% of FDI inflows head for production capacity enlarging operations, but 77% head for operations which do not enlarge the country's production capacity as in 2007) an additional export volume of $(0.23 \times 31) + (0.77 \times 8) = 13$ billion USD might be generated annually.

Chart 23: Employment/ Equity Capital international and domestic companies operating in the manufacturing industry with respect to their sectors.



Source: Calculations by Istanbul Economics based on ISO-1000 (2006) data

It should be underlined that the result of the most realistic scenario, i.e. USD 13 billion, corresponds to 12% of Turkey's total export volumes in 2007 - USD 107 billion.

D - Employment

The weighed average ratio of employment generated by capital investments (per USD 1 million) made by multinational companies operating in the manufacturing industry is 24. In other words, the multinational companies operating in the manufacturing industry generate 24 jobs for every USD 1 million capital investment they make. This figure on the other hand, has been calculated as 21 for domestic companies.

Under the most realistic scenario, the FDI inflows stimulated by IPR improvements will generate an additional employment capacity of **150.000 jobs**.

Accordingly, in case the subject USD 19.2 billion - the additional FDI inflow amount that might materialize on account improvement of the IPR regime - go to the manufacturing industry, the increase in employment capacity can be calculated as follows:

- ~ Under the best scenario (all FDI inflows generate capacity enlargements), an additional employment capacity of; $19.2 \times 1000 \times 24 = 460.000$ jobs;
- ~ Under the worst scenario (all of the FDI inflows head for privatizations, mergers and acquisitions and real estate operations, and do not enlarge the country's production capacity) an additional employment capacity of; $19.2 \times 1000 \times 3 = 57.600$ jobs;
- ~ Under the most realistic scenario (23% of FDI inflows head for production capacity enlarging operations, but 77% head for operations which do not enlarge the country's production capacity as in 2007) an additional employment capacity of; $(0.23 \times 460.000) + (0.77 \times 57.600) = 150.000$ jobs might be generated annually.

The additional prospective 150,000 jobs, under the most realistic scenario, correspond approximately to 0.7% of Turkey's total employment volume of 21 million jobs.

- National income will increase by 0.7% of its GNP; i.e. **USD 4.4 billion**,
- Current export volume will increase by 12%; i.e. approx. **USD 13 billion**,
- **150,000 jobs**, which correspond to 0.7% of current employment, will be generated.

Consequently, in case Turkey catches Hungary's current level in IPR protection, it is predicted according to Ginarte-Park Index of Patent Rights, that;

Romania, another regional competitor of Turkey for FDI might be taken as model country for another simulation . Romania's Ginarte-Park Index score is 4.20 and is therefore 5% above Turkey's, which is, 4.00. So if the simulation made above for Hungary is repeated for Romania, it can be predicted that in case Turkey reaches Romania's level in patent rights protection, its;

- ~ National income will increase by 0.35 % of its GNP ; i.e. USD 2.2 billion;
- ~ Current exports volume will increase by 6%; i.e. approx. USD 6.5 billion;
- ~ 75,000 jobs, which correspond to 0.35 % of current employment, will be generated.

VI. Conclusion and Suggestions

It is an established fact that the levels of protection the countries provide for IPR, affect their economies in many aspects, such as their growth, technological transformation, export and employment potentials, and particularly their FDI inflow potentials. There are significant benefits ahead of Turkey, intent on improving its long-term growth performance, provided that it strengthens its IPR regime. Increases in national income, export and employment potentials and FDI stocks are among these.

It is estimated that the additional FDI inflows Turkey could benefit from, if she would only catch Hungary's current IPR protection level, is approximately USD 19.2 billion. Such an increase in the FDI stock would affect the growth, export and employment performances of the country positively.

There are on the other hand potential losses as well, in case adequate care is not given to protection. The inadequacy of IPR protection would in the first place have adverse effects - direct and indirect - on FDI inflows. The initial unfavorable effects would be on the decisions of transnational corporations planning to invest in Turkey, which are benefiting from technologies and products that can be duplicated easily. Furthermore, the investment decisions of some other transnational corporations, which consider Turkey as a potential investment destination, might also be affected unfavorably from these circumstances. The reason is that the IPR protection performance of a country, functions as a "signal" given by the country to international investors about the general investment environment. The IPR protection level also functions as a significant indicator for international investors confirming that they will be treated justly and be protected from unfair competition in the subject country. It is apparent from this perspective, that the unfavorable economic effects of IPR violations will not be restricted only to companies and sectors subject to such violations. IPR violations establish a norm about the overall investment environment prevailing in a country - for all sectors. The unfavorable economic effects of these violations, therefore extend beyond the losses inflicted directly, and include the lost potential contributions of FDI, which would have gone to the subject country but have abandoned this decision because of IPR violations. In other words, IPR protection involves externalities; i.e. improvements in IPR protection will not remain restricted with the protection of the benefits of companies and sectors subject to such violations, but will contribute to the national economy by promoting FDI inflows.

The need for achieving effectiveness in fighting IPR violations acquires even more importance at a time when Turkey endeavors to accomplish its industrial transformation and reinforce its technological structure. Turkey is compelled to reinforce its technological structure in order to transform its production structure, and accomplish productivity increases, which in turn will sustain economic growth. This can be achieved by attracting FDI inflow to areas with higher technology content. FDI inflows to such areas can only be promoted by effective IPR protection.

The possibility for Turkey to capture the above mentioned potential benefits depends on its success in demonstrating at the international platform that IPR violations shall not be tolerated. Laws in Turkey on IPR protection have become to a large extent in compliance with the EU acquis after the Customs Union. The legislative reform on the subject, which was essential, has also been accomplished. The major issue now is to secure the protection provided for IPR by laws, in practice as well.

Concrete suggestions for overcoming the difficulties faced at the implementation and enforcement stage are summarized in the latest report of the Brand Protection Group ("*Marka Koruma Grubu*"). But another indispensable requirement for reaching this target is to change the attitudes and perceptions prevailing in the society.

Turkey's IPR protection policy carries some resemblances with its approach toward unregistered economy. For a long period of time, the unregistered economy was perceived with its positive features in Turkey. Its aspects which alleviate the effects of economic crises and contribute to employment were emphasized, and the fact that, it chains Turkey to a less productive economy with lesser prosperity opportunities, was ignored. Closing one eye to unregistered economy was almost as an implicit social policy. This general approach to the unregistered economy has gradually changed in line with the sectoral reforms which gained urgency, once macroeconomic stability was secured in the country, and the initial steps necessary for fighting the informal economy unregistered economy were taken.

IPR policy as well has from time to time been exploited as a social policy instrument. It was considered that inexpensive but unauthorized copying of foreign-origin technologies and products would generate positive effects on consumers. As in the case of the informal economy, the actual dimension of the harmful effects of IPR violations was missed. That is the reason why the legislative change made in the IPR system must be endorsed by a change in the general social attitude. It is necessary to increase awareness in the society on this issue.

Protection of IPR should not solely remain as a priority of state authorities but should be configured as a goal shared broadly by all sections of the social community. The establishment of this type of awareness again depends on the public policies to be implemented in this direction. In other words, solution of the problems faced in connection with IPR violations, will depend primarily on the implementation of the appropriate education and communication strategies, which will create and strengthen the necessary social awareness.

Other measures that might be useful in IPR protection can be summarized as follows:

A - General Measures

1. Training of Judges and Public Prosecutors:

More importance should be given to the training of judges and public prosecutors in charge of the legal and criminal investigations and judicial processes executed for the protection of IPR, in order to increase their effectiveness in these processes;

2. Increasing the Number of Specialty Courts:

The number of courts specialized on IPR should be increased and specialty courts should be established also in provinces outside the three major ones;

3. Training of Law Enforcement Staff:

The number of security units in the police organization should be increased - particularly in highly populated provinces, where industrial and commercial activities are also intensive, such as Bursa, Gaziantep, Antalya, and the staff working in these units should be trained on investigation methods on diverse intellectual and artistic work categories such as computer software, musical works, etc.;

4. Strengthening of the Social Consensus for Fighting Against the Unregistered Economy:

In Turkey, the general public view has focused on the positive side of the unregistered economy, which seems to generate employment and protect the economy against external shocks. Changing this point of view carries great importance in the fight against the unregistered economy and success in IPR protection. It is considered that it would be helpful to shed light on the burden of unregistered economy on the country's economy. In this connection, it should be emphasized that the unregistered economy confines Turkey to a dilemma, and impedes it from moving towards a more prosperous future, by protecting the unproductive structure and barring it from becoming productive. It should be explained that the social protection function provided by the unregistered economy, can be provided better off by the state, since its financial structure will grow stronger thanks to the benefits to be acquired as a result of the fight with the unregistered economy.

5. Establishing a Centralized Authority to Fight the Unregistered Economy:

There isn't an institutional organization in Turkey, which has assumed the struggle against the unregistered economy and the building of the social consensus necessary in this issue, as its chief mission. The responsibility on this area is currently shared between Finance, Industry, Labor and Social Security Ministries. Even in countries

such as Italy and France, where the unregistered economy issue is not as severe as in Turkey, there are central organization in this subject. It should therefore be helpful to establish an "Anti-Unregistered Supreme Board", which would compose of the representatives of the related public authorities and the umbrella organizations of the private sector, and which would report to the Prime Ministry.

6. Amendment in the Trademark Law:

Subparagraph (b) of paragraph 1, and subparagraph (b) of paragraph 2 of Article 9; and paragraph (a) [in connection with the subparagraphs (b) of paragraphs 1 and 2] and paragraph (c) of Article 61 of Decree Law No.: 556 on "Protection of Trademarks" were ruled invalid by the decision Reference No.: 2005/15 dated 5 July 2008 of the Constitutional Court, on grounds that these provisions conflict with the Constitution. It is obvious that this cancellation decision of the Constitutional Court, which will come into effect in January 2009 will cause a significant void, which will impair public interest, since many actions, which violate IPR will accordingly become lawful, and IPR violations will be encouraged and public health and safety will face a serious threat. A new law should be enacted as soon as possible in order to fill the legal void caused by the subject ruling of the Constitutional Court.

B. Sectoral Suggestions

IT

7. Judicial IT Experts Establishment:

An establishment for Judicial IT experts should urgently be established and measures should be taken to ensure that evidence for investigations made for copyright violations are made ready on time and completely, through active participation of judicial experts;

8. Amendments in the Legislation:

The following amendments should be made in the related articles of the "Law on Intellectual and Artistic Works": (i) It should be clearly stipulated that use of piracy products - even for personal purposes- will be subject to legal and criminal sanctions; (ii) The amendments made in the Law in January 2008 should be cancelled, and the objective responsibilities of premise owners and managers who do not prevent the use of piracy products should be laid down again; (iii) Taking into consideration that the minimum penalty period is 1 (one) year, and penalties is suspended even if a criminal sentence is involved after lengthy judicial proceedings, the lower limit of the penalty should be raised and it should be laid down that a heavier penalty should be ruled in case the offence is repeated;

9. Tax Audits:

The tax authority should check during tax audits whether the software used by corporations are licensed or not, and the related provisions of the Procedural Tax Law should be applied for tax losses caused by such unlicensed products; it should be stipulated that the softwares used in the independent auditors' reports submitted to Capital Markets Board, Istanbul Stock Exchange and similar establishments should be licensed products, in view of the fact that they should be legitimate and that they should not contain any technical and legal risks, and chartered accountants should be responsible for this compliance;

10. Registry:

The computer software registry system of the Ministry of Culture and Tourism - Directorate General of Copyrights and Cinema, should be operated effectively;

11. Avoidance of the use of Piracy Products in the Public Sector:

Use of piracy products in public authorities and offices should be avoided; the requirements of the circular, issued in July 2008 from the Office of the Prime Minister, should be enforced; the necessary administrative punishments should be implemented for managers, who do not refrain from using counterfeit software;

Intellectual and Artistic Works

12. Professional Associations:

Necessary amendments should be made in regulations so that professional associations can take effective roles in all administrative and judicial processes carried out for copyrights protection. For instance; certain licenses or certificates might be issued by professional associations;

13. Banderole Audits:

Provincial Audit Commissions and Municipalities should use their authorities and prevent the sale of intellectual and artistic works in public places; and also seize and punish the persons, who sell products which are subject to banderole but lack it; and confiscate these products.

14. Introducing Certificate Requirement:

Sales of intellectual and artistic works, which lack certificates, should definitely be avoided; effective administrative measures should be enforced for owners of point of sales, where such works are sold without certificates;

Pharmaceuticals

15. Strengthening of Data Exclusivity:

Data exclusivity period should be revised so as to conform to EU requirements; Data exclusivity should be permitted for combination products, like in the EU; Data exclusivity-patent relationship should be revised so as to conform to EU requirements; Data exclusivity should be secured properly in practice;

16. Amendment in the Legislation:

Amendments against right owners should not be made in the "Patent and Utility Model Draft Law"; Annex Patent Certificate option should included in the draft as in the EU;

17. Obeying Competition Rules When Designating Court Experts:

Competition circumstances between companies should be taken into consideration by the court, when designating experts, and persons linked to rival companies, accordingly should not be assigned as experts.

Notes

- 1 - The "intellectual property rights (IPR)" term used in this report will cover intellectual, industrial and commercial property rights.
- 2 - Ginarte-Park index
- 3 - An index value have been generated for each year by taking R&D intensity data of sectors as basis and also taking into account the weightings of the sectoral breakdown of FDI. The FDI Technology Index generated in this manner is given in Chart 10.
- 4 - See. O'Mahony 2003
- 5 - The rate of productivity increase of the sector included in the total factor productivity calculation must be added to this figure, for a direct comparison with the USA.
- 6 - This estimate about the size of the sector was voiced by Chairman of Logo Yazılım Inc. , Tuğrul Tekbulut, from the interview.
- 7 - The groundwork of the index is based on; World Economic Forum Global Competitiveness Index, Ginarte-Park Index of Patent Rights, Special 301 Report the Office of the U.S. Trade Representative on Copyright Violations and 1998 Report of International Trademarks Association, and therefore reflects both the legislative framework and the implementation performance of IPR.

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