

**FOREIGN DIRECT INVESTMENT, EXPORTS and  
OUTPUT GROWTH of TURKEY:  
CAUSALITY ANALYSIS**

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## **Abstract**

The beginning of 1980s constituted a turning point in the economic life of Turkey. At the time, the government decided to shift the economy from an inward oriented and protective system to an outward oriented and liberalized environment. In 1980 the Turkish government initiated a series of reforms to accomplish a major policy shift from import substitution to an export led growth (ELG) strategy, mainly by liberalizing foreign trade. The lifting of repressive controls on financial markets, referred to as financial liberalization, was realized gradually over 1980s as a part of this policy change. Turkey liberalized its capital accounts in 1989, taking an important step towards integrating its economy with the global economic system.

The realization of financial liberalization did not solve Turkey's main economic problems as expected. Although capital inflows contribute to economic growth through their positive effect on private consumption and investment Celasun, Denizer and He (1998), resulted in currency substitution, thereby aggravating inflationary pressure on the economy and rendering monetary policy ineffective. Despite the unstable economic environment in Turkey, capital flows into the country increased steadily after 1990, with net capital inflows reaching more than four percent of gross domestic product (GDP) in some years. Although Turkey made progress in attracting foreign direct investment (FDI), total FDI never reached more than 0.5 percent of GDP in 1990s. This is one of the most salient features of capital flows to Turkey. The major policy shift from import substitution to ELG substantially increased Turkey's export figures and, together with a dynamic private manufacturing sector, Turkey became a major manufacturing base for a number of multinational corporations. Such development, however, have not brought about a corresponding increase in capital inflows. Accordingly, Turkish FDI levels have stagnated over the last 15 years while FDI worldwide increased by a factor of 12 in the same period.

These developments indicate that Turkey's outward looking policies should include FDI as another important component of its growth strategy. This paper aims at demonstrating the effect of Turkey's liberalization process on economic growth by investigating a Granger causal relationship running from exports to economic growth in Turkey from 1987-I to 2002-IV. Additionally, causality tests among trade, FDI and output for the same period are performed to show the inter-relatedness of trade, FDI and growth. The results indicate that the integration of the Turkish economy with the world economy should be enhanced with policies to attract more FDI in order to gain the spill over effects of FDI to output and FDI-led export growth.

**JEL Classification:** F21

**Keywords:** FDI, Exports, Growth, Causality

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## **I. Introduction**

In the international trade literature ELG hypothesis refers to the relationship between exports and aggregate real output. A positive correlation between export growth and real output growth suggested in this hypothesis reflects the view that export-oriented policies contribute to economic growth. The theoretical rationale for this can be summarized as follows (Abdulnasser and Manuchehr (2000):

- i) Keynesian argument that an increase in exports leads via the foreign trade multiplier to output expansion.
- ii) Exports relax the binding foreign exchange constraint to allow increases in imports of capital and intermediate goods, leading in turn to economic growth.
- iii) Exports enhance efficiency through competition.
- iv) Competition gives rise to economies of scale and diffusion of technical knowledge in production, which are potentially important sources of growth.

Thus, international trade and development theory suggests both export growth contributes positively to economic growth and also proposes output can affect export. On the basis of this framework, most empirical work on the effects of export promoting strategy followed in developing countries evaluated openness with trade.

The relationship with exports and growth, grounded in endogenous growth theory, has been tested for Turkey in a number of articles. The results of empirical studies based on testing causality between exports and output for Turkey is mixed and contradictory. While some studies have supported the ELG hypothesis (e.g. Xu (1996); Greenaway and Sapsford (1994)), the empirical results from the bivariate causality tests carried out by Abdulnasser and Manuchehr (2000) have not been supportive of a causal relation running from exports to economic growth. The reasons for these differences may be due to the state of the Turkish economy in different time periods considered and to the different estimation methods used. Furthermore, in the above mentioned studies variables involved are some representations of growth and exports and FDI inflows are not included in the analysis; the interrelationship between trade policy, FDI and growth is yet to be analyzed.

In order to demonstrate the effect of Turkey's liberalization process this paper is organized as follows. Section II reviews the effects of globalization on the Turkish economy in general. Section III outlines the developments in growth, exports-imports and FDI during the period 1990-2002. Section IV investigates openness in Turkish economy by taking into account both the trade and FDI growth links and the possible interactions between them. This section also describes the data, methodology and

empirical findings. Section V concludes by drawing some policy implications from the empirical findings.

## **II. Effects of Globalization on Turkish Economy**

Globalization has started to show its effects on Turkish economy in the form of structural adjustments and legislative regulations in early 1980s, especially after the January 24<sup>th</sup> decisions. In this context, transition to free market economy, opening to foreign markets, export-led growth, reducing the weight of public sector in the economy, privatization, liberalization of the financial system, facilitating to enter the banking sector, developing non-banking financial institutions, utilization of flexible interest and exchange rates, lifting restrictions in foreign currency and free flow of capital or at least alleviating these restrictions, allowing those living in Turkey to open foreign exchange accounts (FX deposits), establishing a capital market, re-organizing the body of Istanbul Stock Exchange and activating it, encouraging both foreign and local investments, funding public expenses heavily with debt due to loss of public revenue because of tax incentives and discounts could be regarded as the effects of globalization over economy.

The adopted economic approach, amendments in legal procedures, newly established institutions, free flow of capital movements, improved level of communication technology, the policy of funding the public sector have been concretely effective on the economy as of the beginning of 1990. Furthermore, the effects of Customs Union with the European Union (EU) were added to those mentioned in mid-1990s.

The economic policies realized in Turkey after 1980 to become more outward looking and the activities that aimed at satisfying the shortfalls of infrastructure such as telecommunication-transport etc could not be supported in accordance with public financing/privatization/foreign direct investments, and financial deficits were tried to be met with short-run capital flows, in other words, with hot money. When the continual increase in public expenses after 1990 was again carried on with short-term financial flows, a decrease in competitiveness and production was observed within the framework of inflation/high level of foreign loans/high level of real interest rate and problems in banking system of the economy.

## **III. Developments in Growth, Exports-Imports and FDI (1990-2002)**

### **a) Economic Growth**

Measured in terms of gross national product (GNP), the annual average economic growth rate was 4 % in the 1980-2002 period. Having the highest in 1987 and the lowest in 2001, respectively as +9.8% and -9.5%, the growth rate fluctuated within a

wide range. It is observed that the annual average growth rate slowed down after 1990. While the average growth rate was 5.2% in the 1980-1990 period, it decreased to 2.9% in the 1991-2002 period.

The average annual growth rate of gross domestic product (GDP) in the 1980-2002 period was approximately 4.2%. GDP was annually 5.2% in the 1980-1990 period whereas the growth rate in the 1991-2002 period decreased approximately to 3.1%.

As it can be observed in Table I, the growth rate of economy slowed down incredibly, continuity in growth disappeared, fluctuations grew in number and their dimension expanded especially after 1990 when compared with previous periods.

**Table I**

**Growth Rates (%) (1987 prices)**

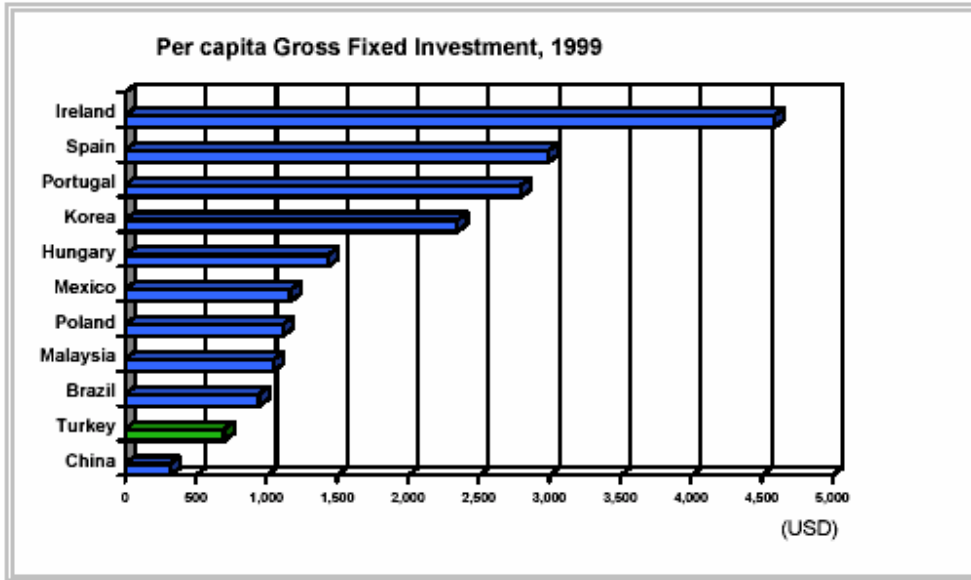
<u>Years</u>	<u>GDP</u>	<u>GNP</u>	<u>Agriculture</u>	<u>Industry</u>
<b>1990</b>	9.3	9.4	6.8	8.6
<b>1991</b>	0.9	0.3	1.0	2.7
<b>1992</b>	6.0	6.4	4.3	5.9
<b>1993</b>	8.0	8.1	1.3	8.2
<b>1994</b>	-5.5	-6.1	-0.7	-5.7
<b>1995</b>	7.2	8.0	2.0	12.1
<b>1996</b>	7.0	7.1	4.4	7.1
<b>1997</b>	7.5	8.3	2.3	10.4
<b>1998</b>	3.1	3.9	8.4	2.0
<b>1999</b>	-4.7	-6.1	-5.0	-5.0
<b>2000</b>	7.4	6.3	3.9	6.0
<b>2001</b>	-7.5	-9.5	-6.5	-7.5
<b>2002</b>	7.8	7.8	7.1	9.4

**Source:** State Institute of Statistics (SIS)

These results also indicate Turkey's basic problem that is to attain an appropriate level of investment to ensure development. In the comparison with other countries, Turkey ranks lowest after China with 706 US Dollar per capita investment.

**Chart I**

**Per capita Gross Fixed Investment**

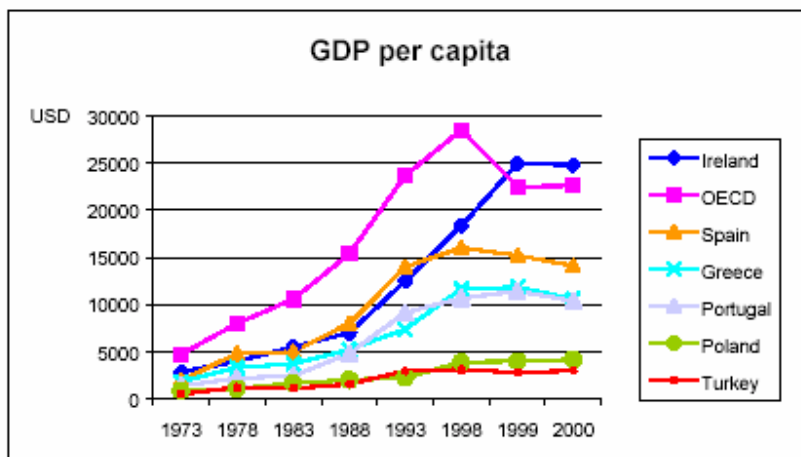


Source: World Development Report 2000/2001, The World Bank

In conjunction with that, Turkey has also lagged behind the Organization for Economic Construction and Development (OECD) countries in per capita national income.

**Chart II**

**Per Capita GDP Comparison**



Source: OEC D

## **b) Exports-Imports**

### **Exports**

While the export level was at about 2.9 billion US Dollar in 1980, it rose to 35.1 billion US Dollar in 2002. In the 1980-2002 period the average annual rise in export on US Dollar basis was approximately 12.1%. As it could be observed in Table II, the increase rate of export displayed a relative slow down in the period after 1990. In the 1980-1990 period, average annual increase rate of export was 16.1% on US Dollar basis whereas the same rate dropped down to 8.9% in the 1990-2001 period.

The composition of products to be exported changed in the 1980-2002 period, decreasing the percentage of agricultural and husbandry products in the export share from 57.5% to 5.8% and increasing that of industrial products from 36.0% to 93.1%. The approximate 6.5% share of mining by-products in exports dropped down to 1.0%.

The distribution of exports among country groups, when the temporary reasons of the Iran-Iraq war are omitted, showed no noteworthy difference. About two-third of Turkish exports (65.8% in 2001, 65.5% in 2002) are made to the member countries of Organization for Economic Cooperation and Development (OECD). EU countries in OECD have an export share over 50.0% (54.0% in 1990, 51.4% in 2001, 51.5% in 2002). OECD countries had an export share of 63.9% in 1979 while that of EU countries was at the level of 48.5%.

### **Imports**

Having reached the highest level in 2000 with 54.5 billion US Dollar while being 7.5 billion US Dollar in 1980, imports realized as 50.8 billion US Dollar in 2002. In the 1980-2002 period, the annual growth rate of imports on US\$ basis was 8.7%. While Turkish exports displayed an increase over the years, imports decreased during times of economic stagnation when compared with previous years. As it can be inferred from Table II, the years 1991, 1994, 1998, 1999 and especially 2001 in the 1990-2002 period were the years when low-level imports were realized.

The content of imports changed during the time of research. While in 1980s the share of consumer goods in imports was 2.1%, the same share increased to 10% in early 2000s (9.9% in 2001, 9.8% in 2002). The share of capital goods within imports was about 20.0% in 1980 whereas it decreased to 16.5% in 2002. The import of intermediary and raw material (including petroleum and petroleum products) also declined during the same period. The distribution of imports in country groups indicated no noteworthy difference. In line with the export activities, approximately

two-third of imports are realized from OECD countries (65.5% in 2000, 62.8% in 2001, 64.1% in 2002). In this context, the share of EU countries in imports is about 50.0% (48.8% in 2000, 44.2% in 2001, 45.5 in 2002). In recent years it is observed that the share of EU countries in imports slightly decreased, on the other hand those of non-OECD European countries and Middle East countries increased.

### **Foreign Trade Deficit**

Turkey has an economic structure which inherently has a chronic foreign trade deficit. Since the World War II the trade balance has had deficits which turned into an unchanged trend during 1980s. As it is indicated in Table II, the trade balance displayed deficits as the lowest in 1994 and the highest in 2000 during the 1990-2002 period respectively 5.1 billion US Dollar and 26.7 billion US Dollar. The amount of foreign trade deficit in the period in question reached a level (not including the shuttle trade) of 176.3 billion US Dollar. During the period the rate of export/import coverage ratio was the highest in 1994 and the lowest in 2000, respectively 77.8% and 51%, averaging to the level of 61.9%.

**Table II**

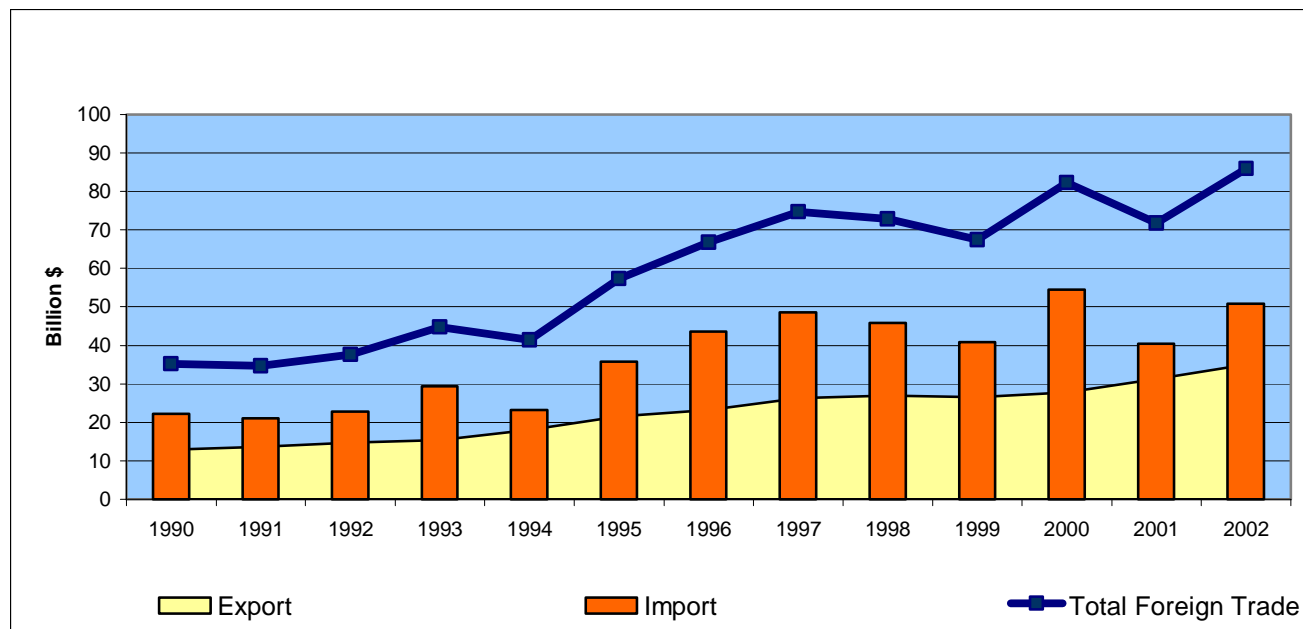
#### **Foreign Trade Indicators of Turkey (1980, 1990-2002)**

YEAR	EXPORT		IMPORT		BALANCE OF FOREIGN TRADE		EX/IMP %
	Value (Million \$)	Change %	Value (Million \$)	Change %	Value (Million \$)	Change %	
<b>1980</b>	2,910		7,513		-5,323		38.7
<b>1990</b>	12,959		22,302		-9,342		58.1
<b>1991</b>	13,593	4.9	21,047	-5.6	-7,453	-20.2	64.6
<b>1992</b>	14,714	8.2	22,871	8.7	-8,156	9.4	64.3
<b>1993</b>	15,345	4.3	29,438	28.7	-14,083	72.7	52.1
<b>1994</b>	18,105	18.0	23,270	-20.9	-5,164	-63.3	77.8
<b>1995</b>	21,637	19.5	35,709	53.5	-14,071	172.5	60.6
<b>1996</b>	23,224	7.3	43,626	22.2	-20,402	45.0	53.2
<b>1997</b>	26,261	13.1	48,558	11.3	-22,297	9.3	54.1
<b>1998</b>	26,973	2.7	45,921	-5.4	-18,947	-15.0	58.7
<b>1999</b>	26,587	-1.4	40,871	-11.4	-14,084	-25.7	65.4
<b>2000</b>	27,774	4.5	54,502	34.0	-26,727	89.8	51.0
<b>2001</b>	31,334	12.8	41,399	-24.0	-10,065	-62.3	75.8
<b>2002</b>	35,081	11.9	50,832	21.6	-15,301	52.0	69.6

Source: State Institute of Statistics (SIS)

**Chart III**

**Total Foreign Trade of Turkey**



**c) Foreign Direct Investments**

Foreign direct investments (FDIs) have displayed a noteworthy increase especially after 1980 due to factors varying from liberalized capital flows, privatization, mergers, joint ventures and GSM sales.

As is shown in detail in Table III, 35.2 billion US Dollar FDI was allowed to enter the country during the 1980-2002 period, 27.2 billion US Dollar of which belongs to the period starting from 1990 on. The volume of realized investment during the mentioned period was 18.5 billion US Dollar, 16.1 billion US Dollar of which belongs the period starting from 1990 on. The proportion of realized investment to the permitted amount is 52.5%. Data point out that FDIs were considerably large in number during the 1980-2001 period especially in 1990 and afterwards; 87% of FDI entered into the country between 1990 and 2001. Taking into account the 1954-1980 period where 325 million US Dollar foreign capital inflow was registered the total foreign investment added up to 18.8 billion US Dollar.

The number firms operating with FDI in 1980 was 78, which has risen to 6,584 as of June 2003. When the number of firms is compared with FDI amount, the FDI per firm is calculated to be approximately 3 million US Dollar. In recent years, the trend of FDI towards the service sector has given rise to a decrease in the average foreign investment amount per firm.

As it can be traced from Table III, while an important amount of foreign capital permits were given to the manufacturing sector till 1995, the service sector has had an important share in the given permits from 1995 on. While the permits given in the 1990-1995 period were 68.3% in relation with the manufacturing sector, this sector's share within foreign capital permits dropped down to 45% in the 1996-2002 period, whereas the share of service sector which was 28.5% in the 1990-1995 period, increased to 52.7% during the 1996-2002 period.

Between 1990 and 2002, the share of manufacturing industry in the sectoral distribution of FDI permits was 56.7%, and that of service sector was 40.6%. FDI can be omitted in agricultural and mining sectors. By the mentioned period the share of agricultural sector was 1.4% whereas that of mining was 1.1%.

**Table III**

### Foreign Capital Investment

Years	Foreign Capital Permits (Million USD)	Sectoral Breakdown (%)		Amount of Actual Investment (Million USD)	Number of Foreign Capital Firms (Cumulative)
		Manufacture	Service		
1990	1,861	65.2	28.7	1,005	1,856
1991	1,967	55.7	41.2	1,041	2,123
1992	1,820	70.0	27.1	1,242	2,330
1993	2,063	76.0	22.4	1,016	2,554
1994	1,478	74.9	22.7	830	2,830
1995	2,938	67.9	28.9	1,127	3,161
1996	3,835	16.7	81.5	964	3,582
1997	1,678	51.9	45.7	1,032	4,068
1998	1,647	61.8	37.0	976	4,553
1999	1,700	66.1	33.0	817	4,950
2000	3,060	32.2	66.2	1,707	5,328
2001	2,725	46.1	48.2	3,288	5,841
2002	2,243	40.0	58.3	1,042	6,584*

\* As of June,30 2003.

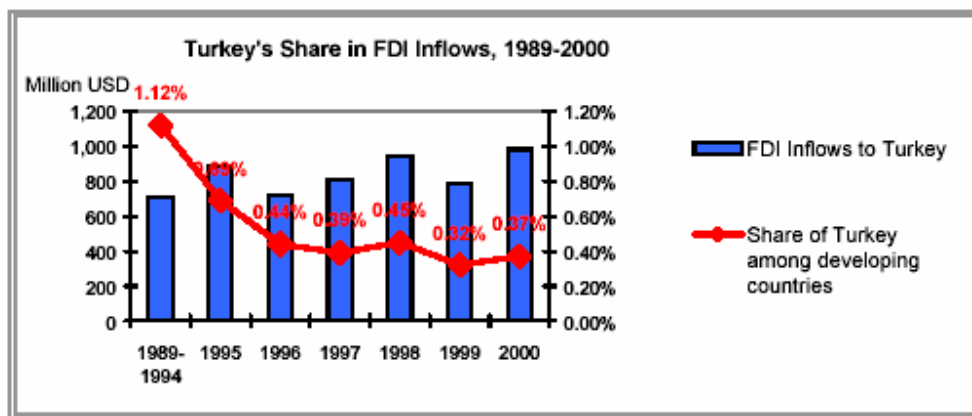
**Source:** Undersecretariat of Treasury, General Directorate of Foreign Investment

Among the foreign capital companies operating in Turkey EU countries have the largest share (69%). The leading country is Germany (1084 firms), followed by Netherlands (449), UK (413) and France (277). Meanwhile there are 393 USA firms operating in Turkey.

Those figures reveal the fact that Turkey is not benefiting from globalization as much as its competitors that, until very recently, had comparable per capita national income levels. The share of Turkey within global FDI flow has dropped steadily to fall to 0.08% in 2000.

#### Chart IV

**FDI inflows (1988-2000)**

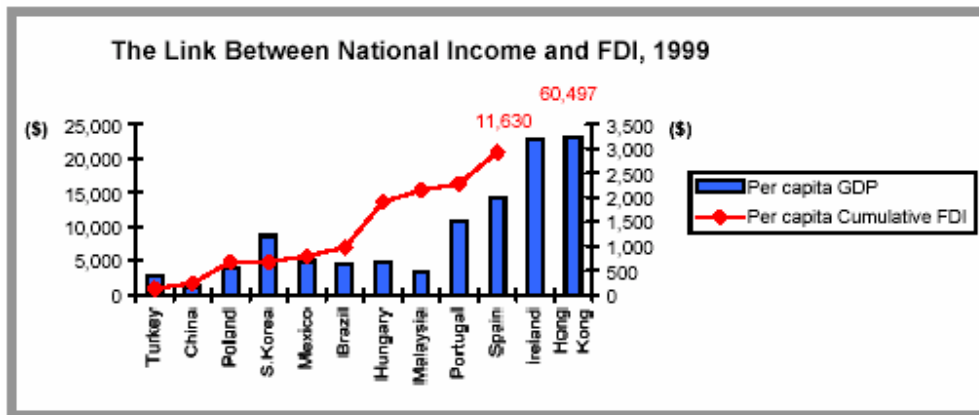


Source: World Investment Report 2001, United Nations

The share of Turkey within global FDI and the performance it displays remain low-level according to various criteria. In general a country's performance is assessed in terms of international capital with the *cumulative FDI/GNP ratio* and the *per capita cumulative FDI*. According to the data of 1999, the annual world average of *cumulative FDI/GNP ratio* is 17.3%. This ratio increases to 28.0% in developing countries whereas in developed countries it is at the level of 14.5%. In comparison with West Asia (9.3%), Middle East Europe (13.3%) and African countries (21.0%) the ratio for Turkey (4.4%) is well below the average.

## Chart V

### The Link between National Income and FDI



Source: World Investment Report 2001, United Nations

Furthermore, according to the data received from United Nations Conference on Trade and Development (UNCTAD) World Investment Report 2001, the amount of *per capita cumulative FDI* was 2,245 US Dollar in developed countries and 194 US Dollar in developing countries but 92 US Dollar in Turkey, having a world average of 528 US Dollar. The total FDI per capita is cumulatively 71 US Dollar in Central Asian countries and 86 US Dollar in African countries. Those figures clearly indicate that Turkey is quite below both the world and developing country average, but comparable to the levels of Central Asian and African countries.

When the FDI distribution of EU countries are studied, it is observed that Turkey's share remains quite below those of probable future members to EU. In the distribution of FDI flow from EU countries in the 1992-1998 period to 11 countries including Turkey, Poland, Hungary, Czech Republic, Russia, Greece, Slovakia, Egypt, Rumania, Israel and Bulgaria, Poland ranks first with a share of 25.0%, Hungary second with 20.7%, Czech Republic third with 18.7%, Russia fourth with 11.0%. With a level of 6.9%, Turkey ranks after Greece in the row. When the FDIs of EU countries are compared with the GNP of the countries in question, Turkey with 1.6% is listed with Egypt towards the end of the row. In spite of the Customs Union, Turkey's share of investment flowing from EU countries remains at a low level when compared with other 10 countries, examined within the scope of the study.

#### **IV. Interrelationship between Growth, Exports and FDI: Data, Methodology and Estimation**

In this study, the causal link between exports, FDI and output is investigated by examining unit root properties and the Granger non-causality tests by using the procedure developed by Toda and Yamamoto (1995) which is expected to improve the standard F statistics in the causality test process. The VAR model covers the period between 1987.I-2002.IV. Three variables were utilized in the model: export (epi), industrial production (ipi), foreign direct investment (fdi). The descriptions of the variables are presented in detail in Table IV.

**Table IV**

##### **Descriptions of the data and statistical sources**

<b>Variables</b>	<b>Description of Data</b>	<b>Source</b>
<b>ipi</b>	Quarterly data on Turkish industrial production index	SIS (2002)
<b>epi</b>	Quarterly data on Turkish export price index	SIS (2002)
<b>fdi</b>	Quarterly data for foreign direct investment flows into Turkey in million of US real dollar (1994=100 index)	Undersecretariat of Treasury (2002)

Notes: All the variables considered in the model are expressed in natural logarithms (denoted by small letters), and all the series used are seasonally adjusted.

The stationarity tests of the variables to be analyzed have been conducted to determine the maximum order of integration of each series as the first step after determining variables. The obtained test results of augmented Dickey-Fuller test are presented in Table V.

**Table V**

**Test for unit root using the ADF test**

<i>Variables</i>	<i>Level</i>	<i>First Differential</i>
<i>log ipi</i>	-1.39 (1)	-9.08 (1) <sup>a,b,c</sup>
<i>log epi</i>	-1.39 (1)	-9.08 (1) <sup>a,b,c</sup>
<i>log fdi</i>	-5.03 (1) <sup>a,b,c</sup>	-7.39 (1) <sup>a,b,c</sup>

Notes: The superscripts a, b and c denote significance at 1, 5 and 10% respectively critical  $\tau$  statistics computed by Mackinnon (1991) are -3.54; -2.90; and -2.59. Accordingly, the series marked with (a,b,c) do not exhibit a unit root at those significance levels. The lag order is presented in the parenthesis after the test statistics for each variable .

Since it is argued that the augmented Dickey-Fuller (ADF) tests have notoriously low power, we rely on the Philips-Perron (PP) unit root test to determine the maximum order of integration of each series. The structural breaks are also controlled by this test.

**Table VI**

**Test for unit root using the Peron test \***

<i>Variables</i>	<i>Level</i>
<i>log ipi</i>	-5.007 (1) <sup>a,b,c</sup>
<i>log epi</i>	-3.510 (1) <sup>b,c</sup>
<i>log fdi</i>	-4.340 (1) <sup>a,b,c</sup>

\* The Peron regression is of the following form:

$y_t = c + \beta_t + dDTB_t + \theta DUM_t + \alpha y_{t-1} + \sum_{i=1}^n b_i \Delta y_{t-i} + v_t$  where  $t$ =linear trend term,  $DTB=1$  if  $t=TB+1$  ( $TB$ =time break=1994, 1998, 1999, 2000) and  $DTB=0$  otherwise,  $DUM=0$  if  $t \leq TB$  and  $DUM=1$  if  $t > TB$ , and  $\Delta$  denotes first difference. The lag order is presented in the parenthesis after the test statistics for each variable. The superscripts a, b and c denote significance at 1%, 5% and 10% respectively. The critical value are -4.1083, -3.4812, -3.1682 at the 1%, 5% and 10% . Accordingly, the series marked with (a,b,c) do not exhibit a unit root at those significance levels.

From Tables V, VI we concluded that each variable is integrated of order one, i.e. I(1).

In the second step the following augmented Granger causality test suggested by (Toda and Yamamoto (1995); Zapata and Rambaldi (1997)) is performed.

$$\begin{aligned} \log ipi_t = & \alpha_0 + \sum_{i=1}^k \beta_i \log ipi_{t-i} + \sum_{j=k+1}^{dmax} \beta'_j \log ipi_{t-j} + \sum_{i=1}^k \lambda_i \log epi_{t-i} + \sum_{j=k+1}^{dmax} \lambda'_j \log epi_{t-j} + \sum_{i=1}^k \delta_i \log fdi_{t-i} \\ & + \sum_{j=k+1}^{dmax} \delta'_j \log fdi_{t-j} + \varepsilon_{1t} \quad (1) \end{aligned}$$

$$\begin{aligned} \log epi_t = & \gamma_0 + \sum_{i=1}^k \varphi_i \log epi_{t-i} + \sum_{j=k+1}^{dmax} \varphi'_j \log epi_{t-j} + \sum_{i=1}^k \mu_i \log ipi_{t-i} + \sum_{j=k+1}^{dmax} \mu'_j \log ipi_{t-j} + \sum_{i=1}^k \theta_i \log fdi_{t-i} \\ & + \sum_{j=k+1}^{dmax} \theta'_j \log fdi_{t-j} + \varepsilon_{2t} \quad (2) \end{aligned}$$

$$\begin{aligned} \log fdi_t = & \partial_0 + \sum_{i=1}^k \ell_i \log fdi_{t-i} + \sum_{j=k+1}^{dmax} \ell'_j \log fdi_{t-j} + \sum_{i=1}^k \tau_i \log ipi_{t-i} + \sum_{j=k+1}^{dmax} \tau'_j \log ipi_{t-j} + \sum_{i=1}^k \psi_i \log epi_{t-i} \\ & + \sum_{j=k+1}^{dmax} \psi'_j \log epi_{t-j} + \varepsilon_{3t} \quad (3) \end{aligned}$$

Here  $ipi_t$ ,  $epi_t$  and  $fdi_t$  indicate Turkish industrial production index, export price index and foreign direct investment respectively.  $\varepsilon_{1t}$ ,  $\varepsilon_{2t}$  and  $\varepsilon_{3t}$  are error terms. These terms are assumed to be white noise with zero mean, constant variance and no autocorrelation, In (1), causality implies that  $eipi$  “Granger-causes” ‘ $ipi$  provided that  $\lambda_i \neq 0 \forall_i$  and  $fdi$  “Granger-causes” ‘ $ipi$  provided that  $\delta_i \neq 0 \forall_i$  the same way, in equation (2),  $ipi$  ‘Granger-causes’  $eipi$  if  $\mu_i \neq 0 \forall_i$  and  $fdi$  “Granger-causes” ‘ $eipi$  provided  $\theta_i \neq 0 \forall_i$ . In (3), causality implies that  $ipi$  “Granger-causes” ‘ $fdi$  provided that  $\tau_i \neq 0 \forall_i$  and  $eipi$  “Granger-causes” ‘ $fdi$  provided that  $\psi_i \neq 0 \forall_i$

What has been suggested is that in a regression context for determining if some model parameters are jointly zero, the traditional F-test is ineffective when the variables display an integrated or cointegrated structure and the test statistics lack a standard distribution (Zapata and Rambaldi, 1997; Giles and Williams, 1999). In other words if the data are integrated or cointegrated, the usual tests applied for exact linear restrictions on the parameters (e.g. the Wald test) do not exhibit usual asymptotic distributions. In order to handle this aspect, and to not to get into the pre-testing distortions associated with prior tests for non-stationarity and cointegration, the

procedure proposed by Toda and Yamamoto (1995) is chosen. The application of the procedure leads to a point where the usual test statistics for Granger causality exhibit

standard asymptotic distributions. A modified Wald test (MWald) for restrictions on the parameters of a VAR (k), where k is the lag length in the system, is utilized by the procedure that was developed by Toda and Yamamoto (1995). When a VAR (k+d<sub>max</sub>) is predicted (where d<sub>max</sub> is the maximal order of integration to occur in the system), this test displays asymptotic chi-square distribution. It is also shown that if variables are integrated of order d, the usual selection procedure is valid whenever k ≥ d.

After determining that the most appropriate lag length as k=2 and dmax=1, the causal link between export series(epi), FDI series(fdi) and output series(ipi) based on p-values for the modified Wald (MWald) statistics are presented in Table VII.

**Table VII**

**Test for Granger – Causality with Toda and Yamamoto Modified Wald Test**

<i>Ho</i>	<i>p-value</i>
<i>epi does not Granger cause ipi</i>	<i>0.0150</i>
<i>ipi does not Granger cause epi</i>	<i>0.1203</i>
<i>fdi does not Granger cause ipi</i>	<i>0.2850</i>
<i>ipi does not Granger cause fdi</i>	<i>0.3049</i>
<i>fdi does not Granger cause epi</i>	<i>0.3506</i>
<i>epi does not Granger cause fdi</i>	<i>0,3802</i>

Notes: The order of k was chosen to be two. The order of dmax was chosen to be one for each variable.

According to estimation results, ipi and epi are casually related in the long run, and the Granger causality is uni-directional running from export growth to output growth (i.e. from epi to ipi). There exists no causality link between fdi-ipi and fdi-epi, in other words for the Turkish economy we have not found any significant positive spillovers from FDI to export suggesting a kind of FDI-led export growth linkage.

**V. Concluding Remarks**

The Turkish economy was reformed and became more outward looking with the structural adjustment program launched in the 1980's. The main objectives of this

program can be summarized as: i) minimizing state intervention; ii) establishing a free market economy iii) integrating the economy with the global economic system. This liberalization process through liberalized import regime, new foreign investment and export promotion policies have enabled Turkey to take its place in the global economy. In this context, during this period Turkey's export figures increased substantially and capital inflows contributed to economic growth through their positive effect on consumption and investment but the growth rate of the economy slowed down and continuity in growth disappeared especially after 1990s. The main reason behind this relatively poor record of growth performance is the inadequate level of savings to act as a source of investments.

In this paper the developments in Turkish economy in relation to growth rate, exports and FDI are investigated. Using VAR methodology we analyzed the existence of causality between export, FDI and domestic performance of Turkey. Our results are in line with the ELG hypothesis, but do not confirm the existence of FDI-growth nexus, in other words we have not found significant positive spillovers from FDI to output. Furthermore our findings do not suggest a kind of FDI-led export growth linkage, hence only with more foreign capital investments flowing to Turkey FDI may have a powerful effect over output.

In short, these findings suggest Turkey's capacity to progress on economic development will depend on her performance in attracting foreign capital. The main conclusion of this paper is that Turkey's outward looking development strategy should include FDI as an essential part in addition to export-promotion strategy followed from 1980 on.

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